BlackRock

Lessons from COVID-19:

Liquidity Risk Management is Central to Open-Ended Funds

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Introduction

The Global Financial Crisis in 2008 ("GFC") began in the financial sector and propagated out to the real economy. A combination of poor underwriting standards, excessive leverage throughout the financial system, gaps in supervision, and – in some cases – fraud resulted in an historic global recession. Following the GFC, policy makers implemented reforms to strengthen the resilience of the financial sector, including reforms that reshaped the regulatory environment across a wide range of asset management products and activities. These reforms included new rules for money market funds, registration and reporting requirements for private and alternative funds, enhanced mutual fund and investment adviser reporting, expansion of liquidity risk tools, and detailed liquidity risk management and stress testing programs for mutual funds. Our *ViewPoint* "*The Decade of Financial Regulatory Reform: 2009 to 2019*" details the rules that were introduced specific to the asset management sector.

The COVID-19 Crisis in 2020 began as a health crisis and became an economic crisis. Countries around the world took measures to contain the pandemic, which included locking down significant portions of their economies. In response, financial markets experienced sharply increased volatility and liquidity deteriorated significantly, including in markets traditionally seen as very liquid and low risk. While the GFC is often referred to as a 'credit crisis', the COVID Crisis is increasingly recognized as a 'liquidity crisis'.

This environment provided an extreme test of mutual funds' resiliency. The vast majority of mutual funds demonstrated their resilience, meeting redemption requests despite challenging market conditions, with only a small fraction of funds needing to use extraordinary risk management tools. Some policy makers and academics have commented on the outflows from open-ended mutual funds ("OEFs") during the COVID-19 crisis, suggesting a mismatch between the liquidity of the underlying assets and the daily redemption feature of many OEFs. Some of these concerns are misplaced and overlook how liquidity risk management tools are applied in managing mutual funds; however, some concerns are valid, and warrant a closer look to identify potential solutions.

We have written a series of ViewPoints addressing Lessons from COVID-19 covering short-term markets, including money market funds, as well as thought pieces on ETFs and on the US municipal bond market.[1] This ViewPoint focuses on other OEFs, primarily bond funds, but also

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income-generating funds such as bank loan funds and real estate funds. We examine the effect of stressed markets on open-ended funds in Part I, addressing market conditions and fund flows in both the US and Europe.[2] Part II reviews the liquidity risk management ("LRM") tools available to managers and their use during March 2020. Part III summarizes the lessons learned from the COVID-19 crisis and makes recommendations to increase the effectiveness of LRM tools, thereby enhancing the resilience of mutual funds.

Key observations and recommendations

Observations

- **The outbreak of the COVID-19 pandemic resulted in a liquidity crisis in March 2020 that contrasted sharply with the credit crisis experienced during the GFC.** The economic and financial implications of lockdown measures around the world were reflected in broad risk-off sentiment and a flight to cash and quality, impacting a wide range of asset classes. In addition, the sudden drop in equity prices drove portfolio rebalancings from fixed income into equities.[3]
- **The cost of accessing liquidity for fixed income securities rose sharply.** While trading volumes in fixed income markets generally held up through March and April, price uncertainty and transaction costs increased significantly. Central bank interventions were targeted to addressing these market conditions via outright purchases plus a series of primary and secondary market programs.[4]
- **Sales of corporate bonds reflected portfolio rebalancings as well as de-risking by multiple market participants.** Bond funds represent only one type of holder of fixed income securities. In the US, for example, mutual funds account for less than 20% of the ownership of any given fixed income sector. In order to understand the market dynamics, we need better data on the remainder.[5] The SEC observed in their recent report on the US Credit Markets:

  "'Commission staff estimate that bond mutual funds experienced $255 billion of net outflows during March 2020, with another $21 billion in outflows from bond ETFs. However, the overall trading volume in the corporate bond market dwarfs these values during the same period and, therefore, it is reasonable to conclude that bond fund redemptions did not materially disrupt this market or materially add to stresses experienced by the market.' [6]
- **Concerns about funds 'forced selling upon credit downgrade' proved to be misplaced.** Bonds downgraded from IG to HY, commonly called "fallen angels," ticked up sharply reflecting the changed economic outlook due to COVID-19 and the sudden decrease in demand for oil. Most mutual funds, however, are allowed to hold 'fallen angels' and many investors are motivated to stay invested in them at least on a short term basis, as downgrades of higher quality names often represent an investment opportunity before the bonds establish a new equilibrium. Furthermore, opportunistic investors and long-term strategic high yield investors viewed wider spreads as an attractive entry point.
- **The heterogeneity of bond funds was reflected in fund flows.** Bond funds include a range of investment styles and underlying asset classes. While during March average weekly outflows from high yield corporate bond funds ranged from 1.8% to 3.8% globally, higher quality funds saw relatively small outflows and, in some cases, attracted inflows.
- **Liquidity risk management is tailored to the type of fund.** Liquidity risk management is central to managing OEFs. Fund managers consider both the underlying asset class and the fund investors in designing a liquidity risk management program for a specific fund. For example, a multi-sector investment grade bond fund will have a different composition than a high yield only fund. Likewise, a fund held in defined contribution plans is likely to have different redemption patterns than a fund distributed on a wealth management platform.
- **Liquidity risk management tools include both ex-ante and ex-post measures.** The increased focus on liquidity risk management, more rigorous liquidity stress testing, and expanded disclosure and reporting since the GFC provided a solid foundation for most funds to meet the scale of flows in March 2020. Fund managers actively manage liquidity risk ex-ante through suitable product structuring, layering liquidity, modelling redemption behaviour, and, in some jurisdictions, employing swing pricing. In extreme situations, some funds can use ex-post tools such as suspending redemptions or in-kind redemptions.
- **While a few European funds suspended dealing, this was due to material valuation uncertainty rather than outflows, and did not result in any contagion across asset managers, asset classes or jurisdictions.** Robert Ophèle, AMF Chairman, noted in a recent speech that:

  "*Open-ended investment funds sometimes faced large redemption requests, but suspensions were rare and did not trigger any systemic spillovers. Furthermore, funds considered vulnerable in the stress simulations by the European Securities & Markets Authority (ESMA) and the European Systemic Risk Board (ESRB) did not face any of the problems feared.*" [7]

- **Securities regulators had extensive data on funds and supplemented this with outreach to market participants.** The GFC reforms included detailed regulatory reporting, providing markets regulators with fund liquidity surveys, fund liquidity characteristics, and large redemptions flows by fund.[8] Once the market experienced stress, markets regulators reached out to participants for real-time color on various sectors and products. In addition to closely monitoring the situation, markets regulators swiftly provided targeted relief.[9]

Recommendations

1 Greater adoption of "swing pricing" or anti-dilution measures in national regulatory frameworks.

We recommend policy makers make the broadest set of liquidity risk management tools available to fund managers.[10] All funds should have anti-dilution tools that assign transaction costs to the transacting investors. Where swing pricing or other anti-dilution mechanisms are permitted but not yet operationally feasible, regulators should work with industry to facilitate them. Swing pricing is particularly effective as it provides an incentive to spread out transactions over time and protects investors from the behavior of others exiting or entering the fund.

2 Facilitate access to market data and transparency on end-investor profiles.

Access to real-time, market-wide data transaction prices and volumes would enable managers to better calibrate models for extreme market conditions. Access to more granular data on fund end-investor types and flows would improve redemption modelling in liquidity stress tests.

3 Ensure fund managers are operationally prepared for stress events.

We recommend that policy makers require managers to have contingency plans in place. As part of their business continuity planning, managers should test the underlying procedures on how to use the full range of available liquidity management tools in a crisis situation.

4 Mandate shorter bank loan settlement periods.

Banks' steps to shorten settlement periods during stress events has been beneficial. Policymakers should consider codifying these changes and other improvements to bank loans such as standardizing deal structures and eliminating manual elements of the operational environment.

5 Exercise caution when considering macroprudential regulation for OEFs.

The liquidity profile of a fund reflects its product design, governance, approach to liquidity layering and stress testing, in addition to the liquidity of the underlying securities. This means the liquidity of a fund is not the same as the market liquidity of its primary asset class. We encourage the availability and use of LRM tools which have been demonstrated to be effective in managing redemption risk. In contrast, macroprudential tools such as mandatory liquidity buffers and mandatory leverage limits are likely to have the effect of encouraging procyclical behavior, thereby increasing systemic risk, while also increasing the cost of capital to issuers.[11]

Contents

1 Fixed income markets and fixed income funds in March 2020

Fixed income markets experienced multiple shocks during March, including: (i) sudden concerns about the creditworthiness of various sectors impacted by COVID-19, (ii) specific concerns about the oil price war and its impact on highly leveraged companies in the sector, and (iii) a flight to quality combined with a dash for cash given the uncertainties introduced by COVID-19. The result was selling pressures across fixed income sectors from US Treasuries to commercial paper to investment grade bonds, high yield and bank loans. Bid-ask spreads and transaction costs widened dramatically, and dealers' willingness and capacity to provide liquidity was noticeably constrained. The ability of issuers to raise new capital was restricted, and the economic outlook prompted elevated levels of credit downgrades from ratings agencies.[12] Central banks intervened with a range of programs targeted at different parts of the markets, aiming to ease conditions and ensure issuers could access capital, which had an immediate impact on investor confidence.

As we discuss in our 2016 *ViewPoint*, *Breaking Down the Data: A Closer Look at Bond Fund AUM*, bond funds are highly diverse. Some areas of differentiation include index versus active, sector-specific (e.g., municipals, HY debt, sovereign debt) versus multi-sector, duration-based strategies (e.g., short-, intermediate-, and long-duration), and market-specific versus global strategies. In addition, most bond funds are permitted to hold some percentage of assets not represented in the fund benchmark. This heterogeneity is important and means the experience of different types of bond funds varies greatly. For example, investors concerned about credit are more likely to redeem from high yield funds than from investment grade funds. Likewise, investors more concerned about interest rates are more likely redeem from intermediate and longer-duration funds over short-duration funds. In practice, this means that in times of market stress some fund types see inflows while others see outflows.

In this section, we examine volatility, market liquidity, and issuance for investment grade corporate bonds, high yield bonds and bank loans and related fund flows in US and European markets.

US market experience

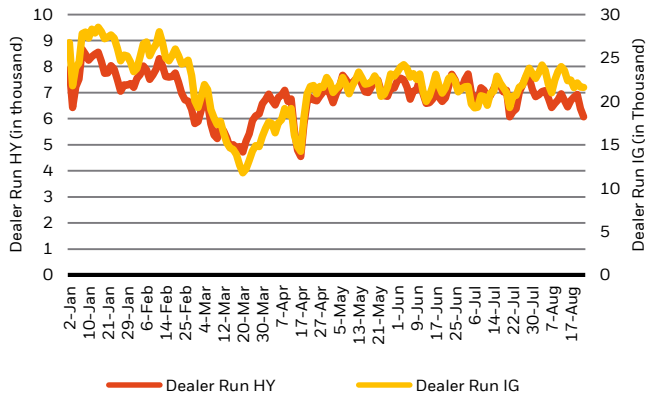
US fixed income markets during the COVID-19 crisis

Investment Grade & High Yield Corporate Bonds

As banks were constrained by their regulatory and contractual obligations, they withdrew from discretionary bond market intermediation. Exhibit 1 shows that the dealer run count (i.e., the number of electronic messages that list securities that dealers are willing to buy or sell) roughly halved for both IG and HY bonds. Limited trading information hampered the normal price discovery process. Exhibit 2 shows price uncertainty – as measured by the standard deviation of price information in dealer run counts and trades – rising sharply for IG and HY bonds, highlighting the lack of consensus on bond valuations in March. Exhibit 3 highlights the widening of spreads in both IG and HY markets, and Exhibit 4 puts the spike in HY spreads in historical context. In March 2020 spreads peaked over 1000bps, the highest in several years – but still notably lower than during the GFC.

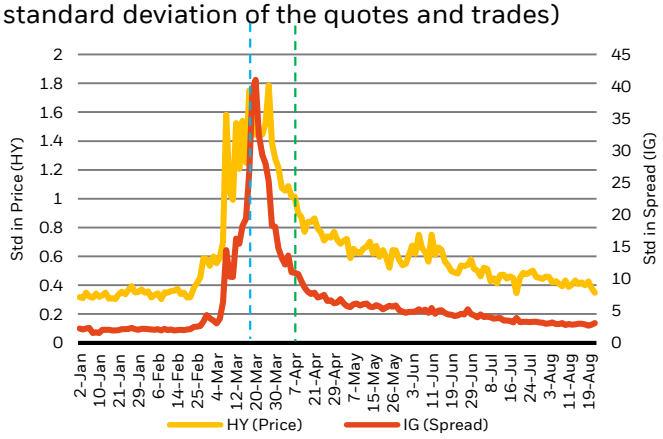
Exhibits 5 and 6 chronicle the issuance of IG and HY bonds. There was significant market uncertainty starting as early as late February: in the last week of February there was zero IG issuance as markets seized up and many issuers did not want to risk a failed transaction. In the following weeks, issuance picked up as issuers rushed to raise cash quickly to weather the storm in the face of increased uncertainty. The announcement of the Federal Reserve (Fed) facilities on March 23rd immediately restored investor confidence, and new issuance soared. Having fallen precipitously during March, with only four new issue bonds totaling $4.2 billion and several weeks where there was zero issuance, HY issuance picked up in mid-April after the announcement that fallen angels and HY ETFs would be included in the Fed credit facility programs.

Exhibit 1: Dealer run count for IG and HY



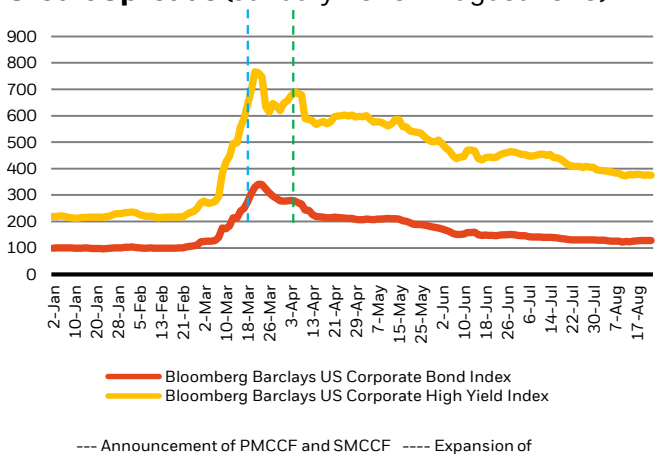
Source: BlackRock market data. Note: we saw the drop in dealer runs after the expansion of the PMCCF and SMCCF because the market was down this week due to weak bank earnings results for Q1 2020 announced on April 15.

Exhibit 2: Price Uncertainty (as measured by standard deviation of the quotes and trades)



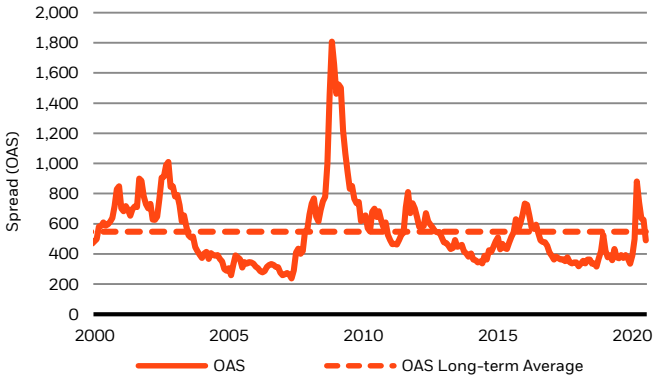
Source: BlackRock market data

Exhibit 3: Investment Grade and High Yield Credit Spreads (January 2020 – August 2020)



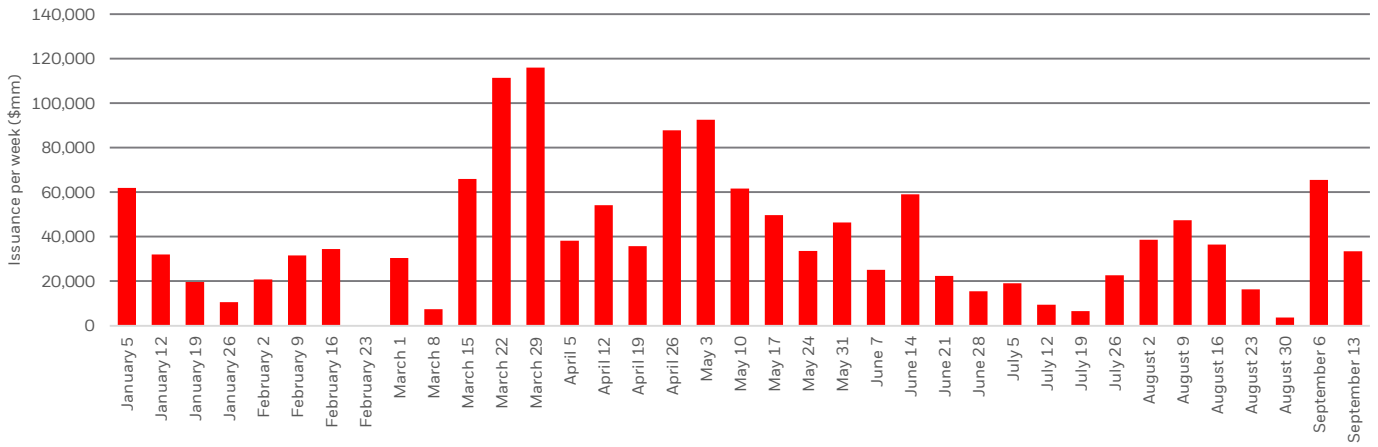
Source: Refinitiv pricing data

Exhibit 4: Historical high yield spreads



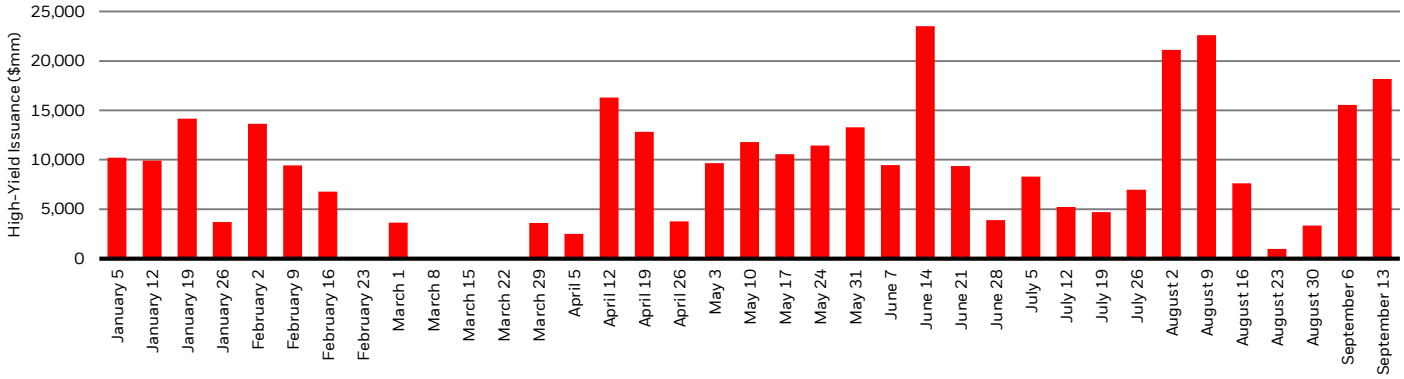
Sources: Barclays, JP Morgan as of 07/31/20. "OAS" are the Option Adjusted Spread of the BBg Barclays US HY 2% Issuer Cap Index. *From 01/01/2000 – 07/31/2020

Exhibit 5: IG Corporate Bond Weekly Issuance, (January – September 2020)



Source: BlackRock market data

Exhibit 6: US High Yield Bond Weekly Issuance (January – September 2020)



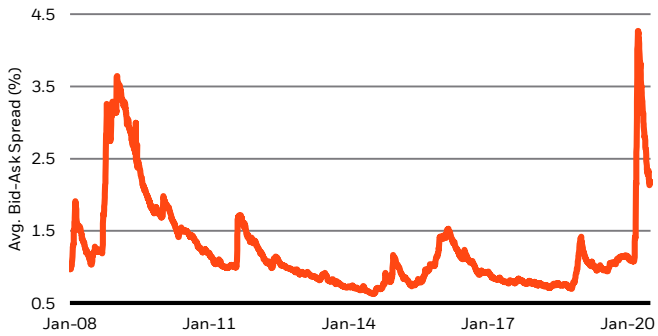
Source: BlackRock market data

Bank Loans

A similar picture of selling pressure during the COVID-19 crisis emerged in bank loan markets. Credit rating agencies moved quickly to adjust the ratings of companies in sectors more exposed to COVID-19-related shutdowns, such as retail, energy, hotels, and leisure. In March 2020 alone, 114 loans were downgraded in the S&P/LSTA Leveraged Loan Index, followed by 228 in April. As of July 31st, 2020, a cumulative total of 873 loans were downgraded YTD in the index. In comparison, 231, 244, and 364 cumulative loans in the index were downgraded in 2017, 2018, and 2019, respectively.[13]

Bank loan prices and transaction costs reflected this environment. Average bid levels (i.e., the simple average of all mark-to-market bid levels) had been around 95 cents on the dollar over the past two years, but fell sharply in mid-March to below 80 cents on the dollar, before rebounding into the low 80s by month-end.[14] As bid levels fell, average bid-ask spreads widened to levels not seen since 2009. Exhibit 7 shows that average bid-ask spreads reached almost 4.25% at the end of March 2020, surpassing the spreads of roughly 3.6% in January 2009. Despite these challenges, secondary market trading volumes functioned well with trading volumes up 75% to reach $119 billion, a new monthly record.[15]

Exhibit 7: Average Bid-Ask Spreads of Bank Loans (December 2018 – June 2020)



Source: LSTA Refinitiv Mark-to-Market Pricing. Based on averages from the S&P/LSTA Leveraged Loan Index.

US Government and Federal Reserve Intervention

The US took multiple measures to alleviate pressure in bond markets, beginning with outright purchases by the Fed of Treasury and Agency mortgage-backed securities. On March 23rd, the Fed announced a pair of programs – the Primary Market Corporate Credit Facility (PMCCF) and the Secondary Market Corporate Credit Facility (SMCCF) to support credit to companies through bond and loan issuances. And, on March 27th, Congress passed the CARES Act which provided over $2 trillion in economic relief, targeting small businesses through the Paycheck Protection Program, state and local governments through the Coronavirus Relief Fund, and individuals through Economic Impact Payments. Using funding from the CARES Act, the Department of Treasury made an initial $50 billion equity investment to the PMCCF and a $25 billion equity investment to the SMCCF. The combined potential size of both facilities is up to $750 billion. Daleep Singh, Executive Vice President and Head of the Markets Group at the NY Fed explained the size of the facilities, noting:

> *"First, the facilities were large enough to demonstrate the Federal Reserve's resolve in putting a floor on the pandemic's impact on credit markets. Indeed, the PMCCF and SMCCF have a combined capacity of up to $750 billion—equal to about eight months of investment-grade corporate bond issuance at the pre-pandemic pace. Second, close coordination with the U.S. Treasury acted as a force multiplier. The equity committed by the U.S. Treasury facilitated broad support for large employers. The facilities' combined capacity leveraged Treasury's committed equity contribution of $75 billion by up to 10 times."*[16]

The PMCCF and SMCCF programs were two in a series of programs targeting specific parts of the capital markets. The PMCCF was designed to ensure issuers had access to financing as new issuance markets were shutting down.

Eligible issuers include businesses that are rated at least BBB/Baa3 as of March 22, including non-bank issuers subsequently downgraded and rated at least BB-/Ba3, also known as "fallen angels." While $50 billion was initially set aside for the PMCCF, as of September 30th, 2020, there had been no uptake. The ultimate use of PMCCF will depend on the length of the crisis and companies' alternate sources of capital. Nevertheless, the announcement of PMCCF sent a positive signal to credit markets, enabling issuers to access the capital markets directly – this underscores the powerful signaling effects of such announcements. [17]

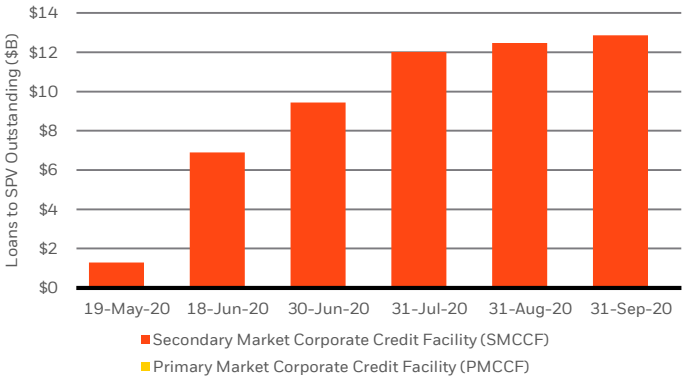
On the other hand, the SMCCF directly targeted the secondary market to restore investor confidence. Eligibility criteria are the same as the PMCCF, with the scope to purchase individual bonds as well as ETFs, with a limit of 10% of a given issuer's bonds outstanding and up to 20% of a given ETF's outstanding shares. [18] Exhibit 8 shows the size of corporate bond and ETF holdings purchased under the SMCCF as of September 30th, 2020 totaled approximately $12.8 billion, about half of the initial allocation of $25 billion. [19]

The signaling power of the CCFs to stabilize markets has been significant, illustrated by the low take-up rates and the fact that the Fed has been steadily decreasing SMCCF purchasing due to improved market conditions. As Daleep Singh explains:

> *"The dramatic improvements in credit conditions have come despite an extremely small CCF footprint that has decreased over time. On account of healthy primary markets, the PMCCF has yet to be tapped. And since mid-May, when we began SMCCF purchases, the pace of our buying has fallen steadily in response to improvements in market functioning. In May and June we purchased about $300 million per day, or about one percent of average daily trading volume in the secondary market, and that pace declined to about $20 million per day by September, or less than 0.1 percent. Currently, the SMCCF holds about $13 billion of overall exposure across corporate bonds and corporate bond ETFs. This is less than 0.2 percent of the outstanding bonds in this $8.7 trillion market."* [20]

The Fed announcements of these programs immediately improved investor confidence, tightening credit spreads and spurring trading and bond issuance. IG and HY credit spreads tightened considerably from the first announcements on March 23rd; and further still from April 9th.

Exhibit 8: SMCCF Purchase Amount ($ billions)



Source: Federal Reserve. As of September 30, 2020.

following announcements of expansions to these programs. HY spreads had fallen back to under 500bps by mid-August, reflecting improved sentiment towards risk assets globally, and an increased allocation to HY by both opportunistic investors and long-term strategic high yield investors who viewed wider spreads as an attractive entry point. Likewise, strong investor demand enabled issuance of both IG and HY debt, and many issuers saw an opportunity to raise precautionary funds at an attractive level and to reduce their refinancing risk by extending revolver borrowings and debt maturities. Exhibits 5 and 6 highlight the rebound in new issuance from IG and HY issuers beginning in March and April, respectively.

A note on fund flow data

For the most part, we use data from EPFR to conduct our analysis on open-ended fund flows, filtering out ETFs. EPFR has the benefit of covering fund flows at a weekly frequency, allowing us to focus in on the most stressed weeks during March; while also giving sufficient granularity to change the focus of the analysis across different categories and sub-categories of funds. This dataset tracks $34 trillion in fund assets, and is the largest sample we are aware of that also allows week-by-week analysis of fund flows.[21] However, while the dataset gives a broad sample of funds by geography, asset class, and investment style, it does not give exhaustive coverage of all existing funds. As such, our analysis gives a sound indication of the composition of fund types, and the dynamics of fund flows, but the data should not be interpreted as exact figures for the whole market.

US fixed income open-ended fund flows

Exhibit 9 gives a high-level breakdown of US-domiciled bond funds. Nearly two-thirds of US bond funds hold predominately investment grade securities – which can include US Treasuries, agency MBS, corporates, sovereign and securitized assets. Bond funds able to invest in both IG and HY bonds – "All Quality" bond funds – are the next biggest segment, and are predominantly "mixed" funds that can invest across sovereigns and corporates. Mixed funds – which taken together comprise over 90% of IG and All Quality funds – include significant amounts of sovereign bonds and government agency securities. The presence of these securities, which tend to be more liquid than corporate bonds, is an important factor in liquidity risk management of these funds. HY bond funds represent just over 10% of the bond fund universe. In contrast to the first two categories, over 90% of these funds are focused solely on corporate debt.

Exhibit 9: US-domiciled bond fund breakdown as of February 2020

Investment Grade	**64%**
of which Corporate	5% (3% of total)
of which Sovereign	3% (2% of total)
of which Mixed	92% (59% of total)
All Quality	**25%**
of which Corporate	4% (1% of total)
of which Sovereign	2% (0.84 of total)
of which Mixed	94% (23% of total)
High Yield	**11%**
of which Corporate	93% (10% of total)
of which Sovereign	0%
of which Mixed	7% (1% of total)

Source: EPFR, AUM as of 26 February 2020

During March, bond funds saw high absolute outflows, but these generally represented a manageable percentage of fund assets. Outflows as a percentage of fund assets were more pronounced for high yield, bank loan and high yield municipal bond funds but still navigable, remaining within a range of redemption scenarios that most asset managers consider in their liquidity risk management planning. Importantly, all US bond funds met 100% of their redemptions. As noted in the SEC's recent report on the US Credit Markets:

> *"Though many observers have been concerned about the ability of bond funds to access liquidity to meet redemption requests during periods of market stress, these concerns did not materialize during the market turmoil of March."* [22]

This outcome reflects the greater use of enhanced liquidity risk management tools (which we discuss further in Part II). In addition, the Federal Reserve's programs to address stresses in the fixed income markets were effective in stabilizing markets and restoring investor confidence, therefore funds were not tested beyond March 23rd.

Investment grade bond funds

The largest segment of US bond funds are 'mixed' Investment Grade or 'mixed' All Quality funds. In aggregate, these two categories represent 82% of US bond funds (see Exhibit 9). [23] By definition, these funds hold Treasuries, agency MBS, IG corporate bonds and asset backed securities. All Quality funds may also hold high yield bonds. In the weeks of March 18th and March 25th, average weekly flows for funds falling within this category ranged between +0.8% and -3.6%. While the absolute amount of fund redemptions were high, these funds had ample liquidity to meet redemptions given the mix of assets and the cash flow characteristics of the underlying assets. Agency MBS, in particular, receive monthly payments of principal and interest.

Investment grade funds holding primarily corporate bonds represent only 3% of total US fixed income fund assets (as shown in Exhibit 9). Exhibit 10 shows that outflows from these (as a percentage of fund assets) were smaller in March than for HY corporate bond funds. This reflects investors' preference for higher quality assets during market volatility and uncertainty.

Exhibit 10: US Corporate Open-Ended Bond Fund Flows (Average weekly percentage flows)

Source: EPFR. Data excludes ETFs. Flows are calculated relative to fund assets at the beginning of each period and weighted by AUM relative to the overall category.

High Yield Bond Funds

High yield bond funds differ from IG bond funds, resulting in different experiences in March. As noted in Exhibit 9, over 90% of high yield funds are sector-specific funds with a focus on corporate bonds. Fund managers will often include an allocation to highly liquid assets including cash and IG bonds in these funds, and HY funds often include allocations to larger deals, which tend to be more liquid than smaller bond issuances.

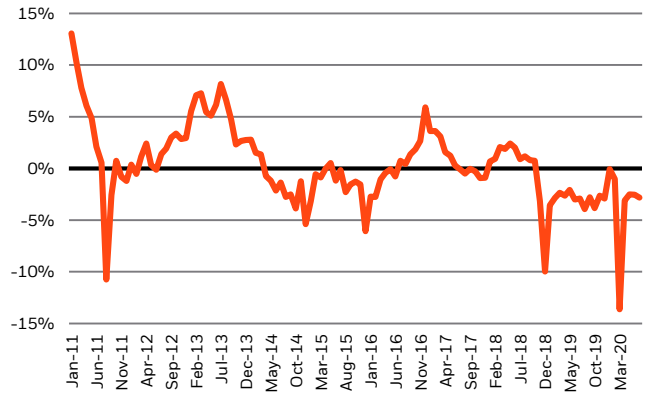
HY funds demonstrated a greater sensitivity to COVID-19 than IG funds. Exhibit 10 shows HY corporate bond funds experienced larger outflows in March and larger inflows in April (measured as a percentage of assets) than IG corporate bond funds. During the most stressed periods, average HY corporate bond fund outflows peaked at approximately 2% of fund assets in the week of March 18th. Outflows reflected a combination of de-risking across markets, concern about credit given COVID's impact on the real economy, and a general "dash for cash."

Bank Loan funds

Bank loans in the US amounted to $1.2 trillion at the end of 2019.[24] As we discuss in our August 2019 *Policy Spotlight:* Non-Bank Lending: A Primer, bank loans can be found in different investment vehicles, including separately managed accounts ("SMAs"), mutual funds, ETFs, and collateralized loan obligations ("CLOs"). In the US, individual investors can invest in bank loans through open-ended mutual funds and ETFs.[25] Exhibit 11 shows that for the month of March 2020, bank loan open-ended funds experienced outflows of roughly 14% AUM or $11.4B. In absolute terms, these were the largest outflows since the December 2018 period, during which global trade tensions and other stresses led to a significant spike in outflows of $13.3B or roughly 10% AUM.[26] In both stress scenarios, bank loan funds met 100% of their redemptions.

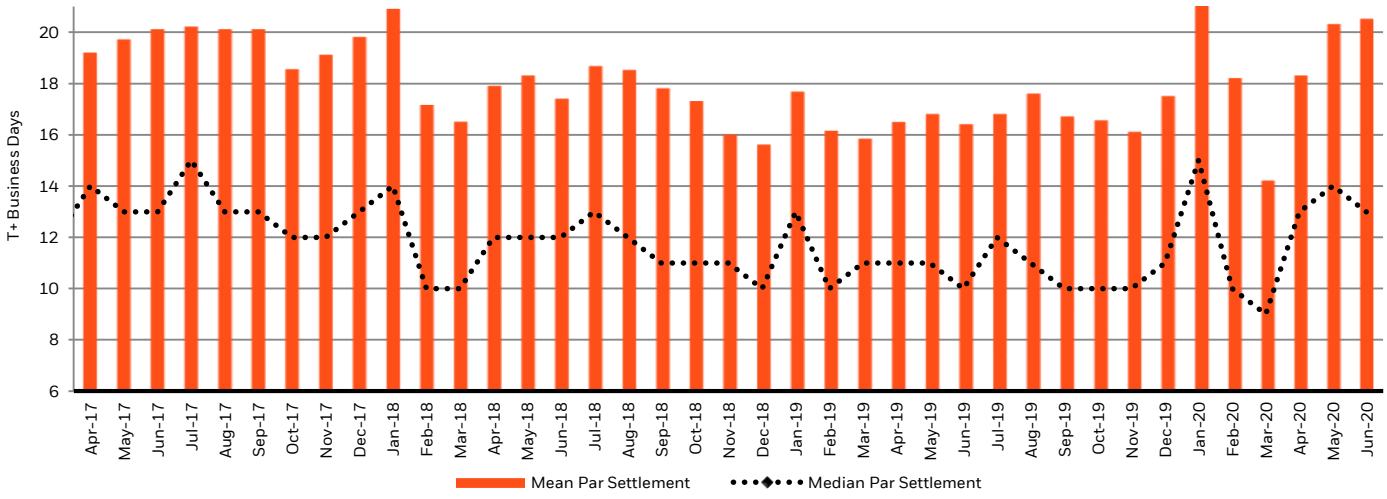
A unique aspect of bank loans is their long settlement period. Bank loans generally settle between T+10 to T+12 days, raising special issues for open-ended bank loan funds. In our Policy Spotlight, we examined the December 2018 period, mentioned above, and we found that banks shortened the settlement period which contributed to the funds' ability to meet all redemptions. Similarly, the Loan Syndications and Trading Association ("LSTA") found in their settlement study that the median average settlement time in March 2020 fell to nine days (T+9) (as shown in Exhibit 12), and 40% of all trades in March 2020 settled in 7 days or less (within T+7).[27]

Exhibit 11: Bank Loan Open-Ended Fund Flows
(% AUM, Monthly, January 2011-August 2020)



Source: Morningstar, as of July 31, 2020.

Exhibit 12: Median Par Settlement Times
(% AUM, Monthly, January 2011-August 2020)



Source: LSTA. As of June 2020

European market experience

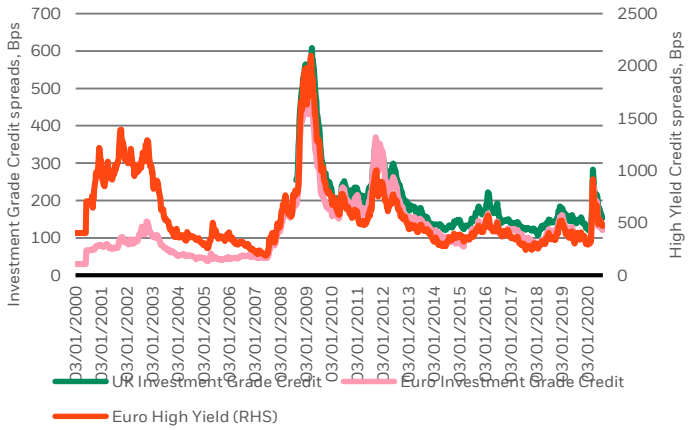
European fixed income markets during the COVID-19 crisis

After Asia, Europe was one of the earliest regions to experience the spread of COVID-19 infections, and to begin implementing lockdown measures accordingly. As elsewhere, this was reflected in risk-off sentiment and a re-assessment of companies' financial prospects. In fixed income markets, this led to sharply higher yields on corporate bonds – both IG and HY – although as Exhibit 13 shows spreads were still well below levels seen during the GFC in 2008, and below those during the European Sovereign Debt Crisis in 2011-12.

Liquidity in fixed income markets came under challenge. Exhibit 14 shows that trading volumes in major European fixed income markets were sustained throughout March and April, meaning some liquidity was accessible. However, the cost of accessing that liquidity, as shown by the level of bid-ask spreads, had risen notably.

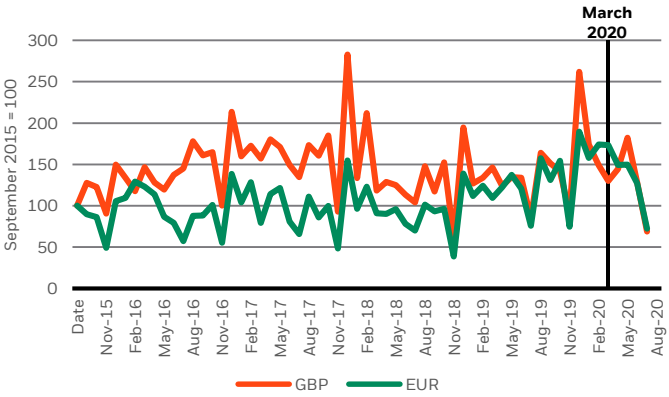
Looking more closely at issuance in European corporate bond markets in Exhibit 15, we observe a mixed picture. Issuance for Euro corporate IG was similar for the first three months of 2019 and 2020. In contrast, HY issuance began the year at elevated levels and then dropped sharply in March. In Sterling markets, corporate IG issuance similarly began strongly before declining sharply in March. While multiple factors were at work here, the timing and scope of central bank interventions – discussed further below – were important contributors.

Exhibit 13: Historical levels of European Investment Grade Credit and High Yield Spreads

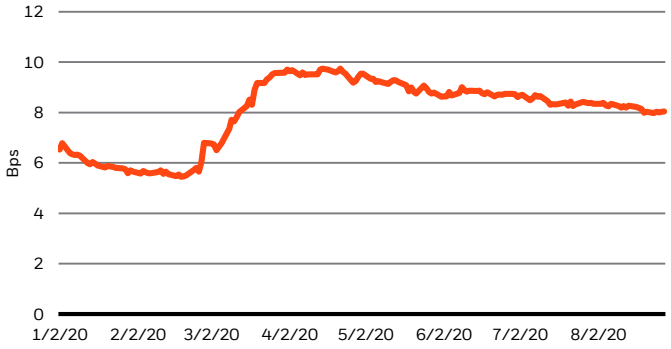


Source: Bloomberg

Exhibit 14: Observed number of trades in EUR and GBP investment grade corporate bonds, and average EUR IG bid-offer spreads

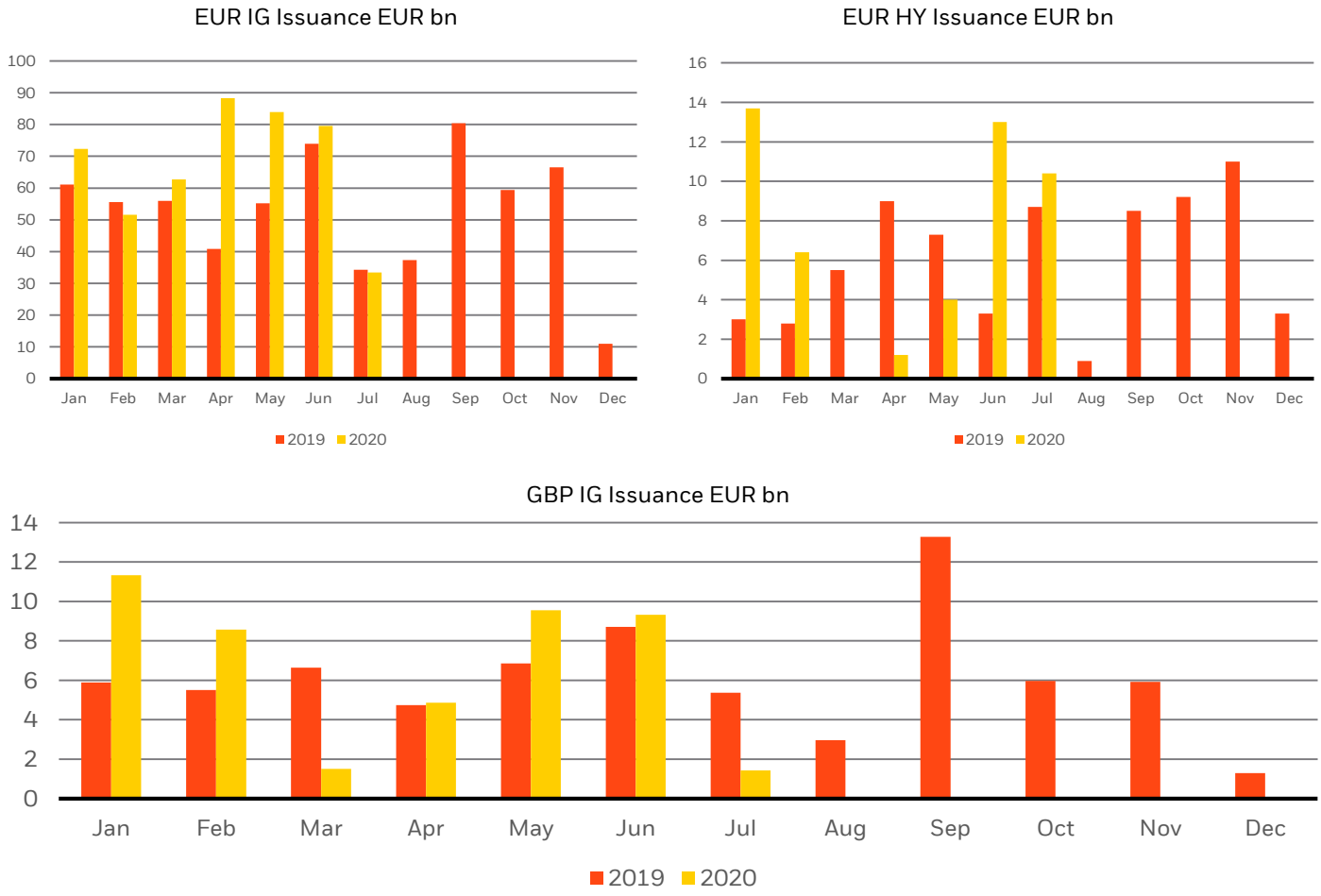


Source: ICE Data Services. The market volume evolution represents the changes in the monthly aggregate volumes of all observed trades a group of IG corporate bonds, rebased to 100 as at September 2015. Includes approximately 4000 EUR Financials securities and 3000 EUR Non-Financials, and approximately 1500 GBP Financials securities and 1000 GBP Non-Financials.



Source: Bloomberg, BlackRock calculations

Exhibit 15: Euro Fixed Income Issuance, Jan 2019 – Jul 2020



Source: S&P LCD, Bloomberg, Barclays Research

Market Intervention by ECB and Bank of England

Central banks implemented wide-ranging support measures across Euro and Sterling markets, helping to restore liquidity. The ECB was an early mover in implementing asset purchases, announcing on 12th March a €120bn expansion of its Asset Purchase Programme (APP) over the course of 2020. On 18th March, eligibility for the corporate sector segment of the APP was extended to commercial paper of select non-financial corporates; and a €750bn Pandemic Emergency Purchase Programme ("PEPP") was announced, targeting all assets eligible under the APP, with conventional country-level and maturity restrictions eased on 25th March. As of 31st July 2020, cumulative purchases from the PEPP had totalled €440bn, of which 8% were (non-financial) commercial paper, 4% corporate bonds, and 1% covered bonds – the remaining 87% being public sector securities.[28] Additional ECB liquidity support was given on 12th March through a 25bp cut on an expanded TLTRO III program; followed by relaxation of collateral acceptability criteria – with Greek government debt included from 7th April, and 'fallen angel' corporate bonds from 22nd April. The fact that the expanded Asset Purchase Programme included corporate bonds from 12th March, while support for HY corporate bonds – specifically 'fallen angels' did not come until later on, may partly explain the different issuance patterns in each market, detailed above.

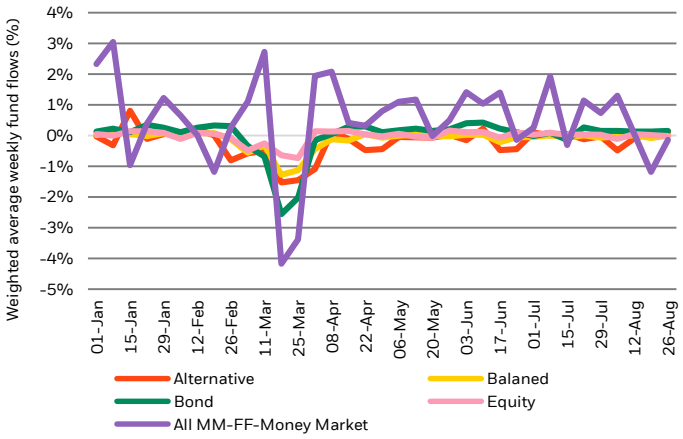
The Bank of England took similar actions: the Covid Corporate Financing Facility, implemented on 18th March began purchasing commercial paper from firms 'making a material contribution to the UK economy'; and an additional £200bn in quantitative easing asset purchases were announced on 24th March – mostly comprised of Gilts, but also including a minimum of £10bn in non-financial corporate bonds. In addition, the Bank of England extended liquidity support for eligible market participants (banks, building societies, broker-dealers, and CCPs) to allow them to repo their less liquid sterling assets.[29]

European Fixed Income Fund Flows

European-domiciled funds experienced significant absolute net outflows in March 2020. These were most significant, in absolute terms, for fixed income and money market funds – as shown in Exhibit 16. Net inflows began to pick up again across all asset classes from the beginning of April onwards as markets stabilised following central bank intervention

While US-domiciled bond funds are primarily focused on US assets (approximately 90% have a pure US investment base), Europe-domiciled funds are highly varied in terms of investment strategy and geographical asset allocation. This reflects the wide distribution network of UCITS, which are registered for sale in over 50 non-EEA jurisdictions.[30] As a result, a significant number of European-domiciled bond funds have a Global, US, and Emerging Market investment focus, in addition to purely Europe-focused strategies. As such, while it may be possible to isolate the behavior of funds investing purely in European markets, this will only capture a portion of assets and will not be representative of the behavior of Europe-domiciled bond funds as a whole.

Exhibit 16: Europe-domiciled fund flows by asset class: average percentage outflows



Source: EPFR. Excludes ETFs

Exhibit 17: Top 10 bond fund (ex ETFs) domiciles and geographic investment focuses globally

Top Top 10 bond fund domiciles by AUM	
Domicile	**% total bond funds**
European Union	44%
USA	41%
Switzerland	4%
Great Britain	3%
Canada	3%
Japan	2%
Thailand	1%
Norway	0.48%
Australia	0.32%
South Africa	0.18%

Top 10 bond fund geographic focus by AUM	
Geographic focus	**% total bond funds**
USA	44%
Global	25%
Europe ex-UK	10%
Global Emerging Markets	8%
Europe incl UK	5%
Canada	2%
United Kingdom	2%
Switzerland	2%
Asia ex-Japan	1.30%
Thailand	1.10%

Top 10 bond fund domiciles vs top 10 geographic focus: % domicile AUM (ex ETFs)

	USA	Global	Europe ex-UK	Europe incl UK	Global Emerging Markets	Canada	United Kingdom	Switzerland	Asia ex-Japan	Thailand
European Union	11%	36%	21%	9%	14%	0%	1%	0%	2%	-
USA	90%	7%	-	-	2%	-	-	-	0%	-
Switzerland	4%	47%	4%	1%	3%	0%	1%	38%	-	-
Great Britain	1%	46%	2%	12%	4%	-	36%	-	-	-
Canada	2%	21%	-	-	3%	75%	-	-	-	-
Japan	13%	41%	1%	1%	7%	1%	-	-	1%	-
Thailand	-	0%	-	-	2%	-	-	-	18%	81%
Norway	-	19%	13%	3%	-	-	-	-	-	-
Australia	-	68%	-	-	4%	-	-	-	-	-
South Africa	-	0%	-	-	-	-	-	-	-	-

Source: EPFR. AUM as of 26 February 2020, excluding ETFs. Percentage figures should be taken as indicative and not exact. Geographic focus of funds should be taken as the primary investment geography comprising the majority of fund assets, however there will be some variation and flexibility within this. European Union is an aggregate of funds domiciled in Austria, Belgium, Bulgaria, Cyprus, Germany, Denmark, Estonia, Spain, Finland, France, Greece, Hungary, Ireland, Italy, Luxembourg, Netherlands, Portugal, Romania, Slovakia, and Sweden.

Exhibit 18 below shows the breakdown of all Europe-domiciled bond funds. The IG bond fund segment is the largest, at just over 50%; followed by "All Quality" bond funds, representing about one-third of the universe. In each segment, "mixed" funds are largest, representing in aggregate around 50% of total bond fund assets. Pure corporate bond funds, which have been the focus of many policymakers and commentators, are a smaller category: pure corporate Investment Grade funds account for approximately 17% of bond fund AUM; corporate High Yield around 11%; and mixed quality corporate around 4%. As Exhibit 17 indicates, the investment geographies for EU and Europe-domiciled funds are dispersed globally, meaning these funds will likely contain many corporate bonds issued outside Europe.

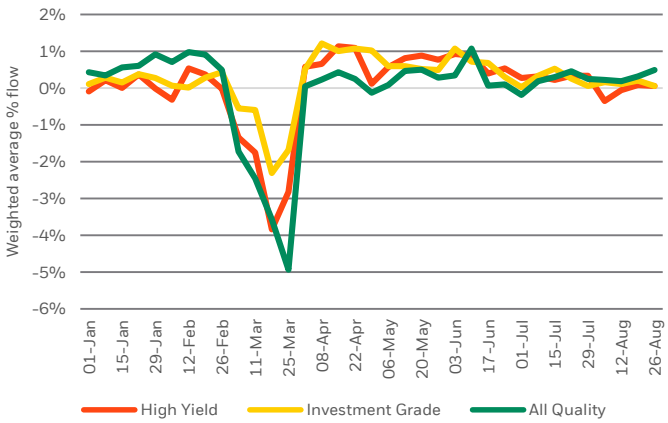
Exhibit 18: Europe-domiciled bond fund AUM breakdown

Investment Grade (BBB- and above)	**54%**
of which Corporate	31% (17% of total)
of which Sovereign	21% (12% of total)
of which Mixed	47% (26% of total)
All Quality	**33%**
of which Corporate	13% (4% of total)
of which Sovereign	11% (4% of total)
of which Mixed	75% (25% of total)
High Yield (BB+ and below)	**12%**
of which Corporate	91% (11% of total)
of which Sovereign	1% (0.2% of total)
of which Mixed	8% (1% of total)
Other uncategorised	**0.03%**

Source: EPFR, as of 26 February 2020, excluding ETFs. EPFR is not a comprehensive sample of all funds, therefore these figures should be taken as indicative. "Europe-domiciled" is defined broadly as any fund domiciled in: Austria, Belgium, Cyprus, Czechia, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Isle of Man, Italy, Liechtenstein, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Spain, Sweden, Switzerland, Turkey, and the United Kingdom of Great Britain and Northern Ireland.

Looking at outflows for pure corporate bond funds over March and April 2020, a similar pattern to other regions emerges. Outflows picked up around early March and rose sharply into the final two weeks of March. As Exhibit 19 below shows, the average weekly outflows from funds – in percentage terms – while heightened, were not unmanageable: in the week to 18th March, pure corporate IG funds saw outflows of around -2.3% on average; pure corporate high yield funds around -3.8%; and mixed quality corporate bond funds around -3.6%. In the following week to 25th March, the respective flows were -1.7%, -2.8%, and -4.9%. As in the US, and as might be expected, mixed IG bond funds saw smaller average weekly fund outflows of –1.3% in the week to 18 March, and -0.5% the following week to 25 March. Of course, these are average figures and in practice there was dispersion in flows between funds: while the majority saw outflows, some funds experienced inflows. [31]

Exhibit 19: Europe-domiciled corporate bond funds: average weekly percentage flows



Source: EPFR. Flows are calculated relative to fund assets at the beginning of each period and weighted by AUM relative to the overall category.

The vast majority of European bond funds, including high yield funds, were – with some idiosyncratic exceptions discussed in the next section – able to meet redemptions. Nevertheless, market conditions in March presented a challenging environment for managing fund liquidity, and underscored the importance of liquidity risk management tools. As mentioned above, liquidity for transactions during this period was generally available, although at an elevated cost. In such conditions swing pricing – among other liquidity management tools – explored in more detail below, proved an effective tool for externalizing the elevated transaction costs associated with meeting redemptions.

2 Liquidity Risk Management in OEFs

Liquidity risk management (LRM) is central to managing OEFs. Fund managers consider both the underlying asset class and the fund investors in designing a liquidity risk management program for a specific fund. Over the past decade, LRM has evolved significantly. Today, best in class LRM starts with the fund design stage and incorporates both ex ante and ex post tools. As discussed in this section, LRM tools are governed by national regulation which differs from one jurisdiction to another. Given that swing pricing is a particularly important liquidity risk management tool both on an ongoing basis and in volatile market conditions, we provide an in depth discussion on swing pricing. Finally, we highlight that a few funds needed to use ex-post LRM tools and we provide brief case studies of these outlier situations.

Post-GFC liquidity risk management rules

Following the GFC, policy makers focused on the need for funds to meet redemption requests, and regulatory reforms raised the bar for liquidity risk management industrywide. In 2018, IOSCO published its Recommendations and Best Practices, which include a comprehensive catalog of recommendations on liquidity risk management, addressed to managers and securities regulators, setting out actions to be taken when initially structuring a fund and on an ongoing basis, as well as tools that might be used in more extreme conditions.

Many of these recommendations have been incorporated into national and regional regulations for OEFs.[32] These include enhanced LRM tools, liquidity stress testing and comprehensive reporting to supervisors to allow a continuous and informed dialogue between regulators and asset managers in both normal and stressed market conditions.[33] As a result, today, securities regulators have the ability to undertake ongoing assessments of funds' ability to deal with stressed market conditions, and asset managers are in a better position to manage funds during times of extreme market stress and volatility. Taken together, this provided a solid foundation for the vast majority of funds to meet the scale of outflows experienced in March 2020.

In 2016, the US SEC passed Rule 22e-4 under the 1940 Act (see Box A). This rule improved the resilience of open-ended

BOX A: Application of Rule 22e-4 to US OEFs

SEC Rule 22e-4 contains provisions that require managers to evaluate the liquidity of fund holdings to ensure they can be converted to cash, in a timely manner, to meet redemptions in a way that does not materially dilute the interests of other shareholders. This requires an understanding of the liquidity of fund assets, of what redemptions and margin calls the fund is likely to face, the structural features of funds, and data on previous and hypothetical scenarios. The processes required to inform these assessments include:

- Reasonably Anticipated Trading Size ("RATS"): managers must determine whether trading a particular asset in sizes that are feasible for the fund, would significantly affect its liquidity. RATS is a function of macro-economic factors, fund returns, and fund attributes such as AUM, investor profile, and investor concentrations; but a core input is the typical redemptions and margin calls the fund might face. Input metrics such as "historical redemption-at-risk" (HRaR) – which looks at redemptions based on historical fund flows; or historical value at risk (HVaR) – which proxies what margin calls on the derivative holdings might look like – can be varied across a range of time horizons and confidence levels depending on how conservatively one wants to set RATS. These metrics help the manager to ensure they have sufficient liquidity to meet both stressed redemptions and stressed margin calls simultaneously.
- Highly liquid investment minimums ("HLIMs"): managers must set HLIMs to ensure funds hold enough liquid assets to meet redemptions without altering the risk profile of the fund. To set these minimums, a nearly identical approach to calibrating RATS can be used, with a view to ensuring that funds have a sufficiently large buffer to allow the fund to manage through a near worst case combined stressed redemption and stressed margin calls. A floor can be included in the estimation of HLIM, so that even if a fund does not have an history of large flow volatility or margin calls, managers can maintain a large enough buffer to meet outflows the fund has not experienced before.
- Stress testing: Stress testing is a critical component to ensure sufficient levels of liquid investments. While not explicitly required under SEC Rule 22e-4, stress testing is encouraged as a component of a fund's liquidity risk assessment. US managers run various types of fund-level liquidity stress tests to prepare for potential or hypothetical scenarios. Stress testing can be based on shocking reasonably anticipated trade size assumptions, average daily volume (ADV) assumptions, or a combination thereof. We examine the EU approach to stress testing models in Box B.
- Proactive portfolio risk management: During periods of heightened market volatility when portfolio managers anticipate there may be higher redemption activity, managers often proactively increase the "highly liquid" bucket of investments to build in an additional layer of liquidity in case of extreme outflows. This can include pivoting to ETFs as a source of liquidity when overall market liquidity conditions are challenging.

funds and was designed to enable funds to manage liquidity risk, meet investors' redemptions, and minimize the impact of redemptions on the fund's remaining investors, particularly in times of stress. It requires all open-ended funds to have a written liquidity risk management program, which must be approved and reviewed by the fund's board; and requires funds to classify the liquidity of each of the investments in its portfolio based on the number of days in which the fund reasonably expects the investment to be convertible into cash without significantly changing the market value of the investment. Funds are further required to determine a minimum percentage of net assets that must be invested in highly liquid investments (i.e., assets that can be liquidated in three days—this is known as the "highly liquid investment minimum"), as well as procedures to respond to a shortfall in highly liquid assets, which include reporting to the fund's board of directors and the SEC. Finally, Rule 22e-4 places a 15% limit on funds' illiquid investments. Funds are required to notify their board of directors as well as the SEC if their illiquid invests exceed 15% of its net assets. This early engagement with the SEC and the fund's board fosters discussion and helps to address potential issues and mitigate risks. In the adopting release, the SEC commented:

> *"Together with the rest of the liquidity risk management program requirements we are adopting, [the highly liquid investment minimum requirement] is a central tool to help put a fund in a solid position to meet redemption requests without significant dilution of remaining investors' interests. The highly liquid investment minimum requirement, together with the classification requirement and the 15% limitation on a fund's investments in illiquid investments that are assets, is meant to be a primary component of a fund's overall approach to liquidity risk management."* [34]

In the EU, the UCITS Directive contains provisions on eligible investments designed to ensure ongoing liquidity and to limit the holding of illiquid assets, which are monitored by an independent depository who will escalate any breaches to the local regulator.[35] More recently, this has been complemented by MiFID II product governance rules; and enhanced further still by ESMA liquidity stress testing Guidelines for AIF and UCITS managers. [36]

As detailed in Box B, ESMA's liquidity stress testing Guidelines require fund managers to stress test the assets and liabilities of the funds they manage to different types of market risks on a regular basis – such as interest rate risk, liquidity risk, marginal call risk, and redemption risk. Managers of AIFs and UCITS are in turn required to use the results of these stress tests to take action and mitigate these risks, and to notify their local regulator of any material risks and actions taken.

BOX B: Illustration of the application of the ESMA Guidelines to European corporate bond funds

The ESMA Guidelines set out processes for stress testing assets and liabilities to determine overall portfolio liquidity, in order to create options for managers to manage potential redemption pressures and ensure sufficient fund liquidity. These processes include:

- Assessing asset liquidity by simulating the time it would take to liquidate each asset in a full portfolio liquidation. Managers will assess the 'days to trade' the whole portfolio, taking into account the average daily volume (ADV) of each asset. In dealer driven markets such as IG corporate bonds, ADV estimates may include an assessment of aggregate sector liquidity, driven by dealer balance sheet constraints, and individual characteristics such as time since issuance (new bonds are generally more liquid than old bonds). Further adjustments are made to reflect both normal and stressed market conditions.
- Understanding fund liabilities by assessing investor concentration and with 'what if ' scenarios for redemptions by the fund's largest investors; the risk of historically high levels of redemptions over different time horizons; and the potential impact of collateral calls over a similar time horizon.
- Estimating market impact and transaction costs as an additional component to the liquidation amount, considering the differences between both normal and stressed market conditions; or for different liquidation strategies.
- Reverse stress testing – more often used for investment strategies exposing them to low-probability risks with a potentially high impact – enables managers to assess at what level of stress assets no longer cover liabilities.
- Selection of liquidation strategies to meet redemptions depending on the nature of the fund, its underlying portfolio composition, investor base and expected fund flows, and the need to meet UCITS investment restrictions on illiquid asset holding. A common strategy is 'pro rata liquidation' where the pace of liquidation is determined by the least liquid position: i.e. if the longest days-to-unwind of all positions is 10 days, then the entire portfolio is liquidated over 10 days. Pro-rata liquidations ensure the profile of the portfolio remains consistent over time. In practice, this may be modified to use a pro-rata approach on the liquid portion of the portfolio, with a limit on how large any illiquid portion of the assets may grow. Managers may choose to use fund flows to actively reposition the portfolio to minimise transaction costs by, for example, not selling securities they wish to increase their relative holdings of when meeting a redemption.

Ex Ante and Ex Post Liquidity Risk Management Tools

Liquidity Risk Management needs to be tailored to reflect the underlying assets and the investors in the fund. The objective of LRM is to equip a fund with ex-ante tools that mitigate the need for ex-post tools to meet redemptions, as IOSCO has noted:

> *"OEFs should not be managed in such a way that the investment strategy relies on any additional ex-post measures such as suspensions. These measures are not a substitute for sound liquidity risk management from the outset, so that the dealing frequency of units meets the anticipated liquidity needs of the fund under normal and foreseeable stressed market conditions."* [37]

Exhibit 20 summarizes the ex-ante LRM tools used in the design phase and on an ongoing basis, and ex-post tools that are employed only rarely.

Exhibit 20: Schematic of liquidity management processes and tools in the lifecycle of a fund

Ex-ante tools: At design phase

- An **appropriate fund structure**, taking into account the underlying asset and intended client base of the fund.
- Design of a **liquidity management policy**, including procedures to maintain levels of liquid assets appropriate to the fund structure and redemption terms. For example, alternative fund structures often include minimum notice periods that an investor must give to a fund manager of their intention to redeem their investment from the fund.
- **Valuation policies and procedures**, such as fair value pricing, to manage scenarios where fund assets are difficult to value. Should include procedures to update parameters of these models promptly in response to market conditions.
- Design of an **appropriate governance structure** to ensure effective liquidity risk management, with effective independent oversight or controls to deal with the information produced. This should include appropriate escalation procedures, ensure that risks to the fund are considered and managed holistically – for example, taking into account the inter-relationship between valuation and liquidity – and cover the allocation of responsibility for application of contingency plans.
- Setting reasonable **controls and monitoring of illiquid asset classes** to ensure they do not compromise the liquidity offered to investors by the fund.
- **Prudent use of leverage** with ongoing monitoring and management, and appropriate policies on funding and margining practises.
- Consideration of the appropriateness of **exceptional liquidity management tools** during the design and authorisation process.
- **Disclosure to investors of pricing methodologies for subscriptions and redemptions**, such as swing pricing, to manage investor expectations and inform their decisions
- **Disclosure to investors on use of liquidity management tools**, setting out actions the fund would take in the event of a liquidity problem and describing clearly how investors could be affected. For example, funds may inform investors that the they will not accept deals when the underlying markets are closed on holidays, to minimize the risk of dealing in less liquid market conditions.

Ex-ante tools: On an ongoing basis

- **Measuring or estimating the levels of liquid assets and liquidation time frames** for fund holdings under normal and stressed market conditions;
- **Analyzing transaction costs in varying market environments** and understanding the impact of stressed markets on cost and "capacity" to liquidate assets.
- **Managing redemptions to avoid the fund becoming increasingly illiquid** by disproportionately selling liquid positions to meet cash requirements. This can be achieved though liquidity bucketing and/or pro rata or waterfall liquidation strategies selling across the fund's portfolio, to ensure that the risk and liquidity profile of the fund's underlying assets remain constant. Only selling the most liquid assets to meet redemptions runs the risk that the fund's liquidity profile decreases. Fund managers often cap illiquid asset holdings to ensure subsequent rounds of redemptions can be met.

(continued on next page)

Exhibit 20: (cont'd from previous page)

Ex-ante tools: On an ongoing basis (cont'd)

- Regulators typically require that **stress tests should be carried out on a regular basis** based on normal and stressed scenarios (for example, atypical redemption requests). Scenarios typically include backward-looking historical scenarios and forward looking hypothetical scenarios, and are based on parameters calculated using statistical techniques or concrete stress events.
- **Ensuring sufficient sources of liquidity to meet liabilities** under a range of scenarios.
- **Estimating fund redemptions based on historical shareholder behavior** under normal and adverse market conditions (which may not be revealed in a fund's redemption history).
- **Monitoring investor profiles and related redemption behaviors** to identify potential liquidity needs, accounting for differences between institutional and retail investors, or large and small investors.
- Where permitted, managers may use **soft closures**: closing the fund to new subscriptions while continuing to allow redemption requests. This is particularly useful where the manager assesses that there are capacity constraints in accessing liquidity in the underlying assets, and where it is in investors' interests to prevent a fund from growing too large.
- **Ongoing use of fund pricing mechanisms and anti-dilution tools** such as swing pricing and dual-pricing to allocate costs of dealing in underlying assets to transacting investors
- Regular **testing and updating of contingency planning** procedures
- **Ongoing investor disclosure and communication**. Ongoing dialogue with investors who have the ability to make large redemptions is particularly important for providing advance warning of large deals, and ensuring that remaining investors are not unduly disadvantaged,
- Effective communication and **reporting on fund liquidity and redemption profiles to regulators**.

Ex-post tools

- **Anti-dilution measures** such as redemption or exit fees. These are designed to protect existing or remaining investors from bearing the costs of buying or selling the underlying investments as a result of large inflows into or outflows from a fund. While other anti-dilution measures such as swing pricing are designed to be used on an ongoing basis, their use often increases in stressed market conditions.
- **Gates and deferred redemptions.** Redemption gates are partial restrictions to investors' ability to redeem their capital beyond a certain threshold – for example 10% - with the non-executed part either being cancelled or automatically carried over to the next valuation/dealing point. Similarly, with deferred redemptions, deals are automatically carried over to a subsequent dealing point.
- **In-kind redemptions** facilitate the exit of investors from the fund without requiring the manager to liquidate fund holdings, subject to appropriate valuation procedures. These are particularly useful for redemptions by large institutional investors with dedicated custody accounts.
- **Repo** transactions allow securities to be lent out temporarily, providing an additional source of liquidity, assuming that fund leverage limits have not been reached. Usability varies depending on local regulation – for example it is permissible for in the US for registered investment companies and AIFs, but not for UCITS in the EU.
- **Lines of credit.** Single mutual funds may have access to a dedicated credit facility, or to shared credit facilities that can be accessed by several funds. Asset coverage and/or asset segregation requirements in the US mean that a fund cannot incur significant amounts of leverage in utilizing these options. In the EU, borrowed funds must typically be repaid within a short period of time, e.g. to comply with UCITS temporary borrowing requirements.
- **Side pockets.** Illiquid assets can be transferred to a separate account – 'side pocket' – pending sale, and remain outside the fund's normal dealing cycle while otherwise allowing dealing in the remaining assets of the fund to continue. These are typically used in alternative fund structures and are rarely permitted in retail mutual funds.
- **Suspension of dealings.** A suspension prevents investors in the fund from withdrawing their capital, and is designed as a temporary measure for a short period of time. The purpose is to prevent excessive redemptions times of market stress, but can also be necessary when valuation uncertainty for the fund assets mean fund units cannot be priced properly.

Swing Pricing as a Liquidity Risk Management Tool

Each regulatory jurisdiction has control over which liquidity management tools are available to funds domiciled within them. Many European jurisdictions – such as Ireland, Luxembourg, and the UK – have offered a full toolkit of measures for many years; others have more recently increased the range of the liquidity management tools available to local managers – for example, France in 2014, Spain in 2019, and Germany in 2020. Nevertheless, gaps remain, as highlighted by the ESRB and by ESMA in a recent communication to the European Commission. [38]

In most European markets, national securities regulators permit the use of "swing pricing." Swing pricing essentially allows the fund sponsor to adjust the price of a fund unit using a bid-ask spread known as a "swing factor," so that all investors who deal on a given dealing day bear the cost of transactions to meet their redemptions (or subscriptions when there are large inflows). Swing factors reflect the anticipated dealing costs associated with accessing liquidity in the underlying market and so is used on an ongoing basis through various market conditions. BlackRock, as well as many other asset managers, regularly uses swing pricing in most of its Europe domiciled mutual funds.

European investors are well acquainted with swing pricing, and the mechanisms used are clearly disclosed in fund documentation.[39] Swing pricing protects remaining investors and fund performance by ensuring the transacting investors bear the cost of liquidity, thereby incentivizing requests to be spread over a number of days, and removing the potential for first mover advantage. This is particularly beneficial in stressed market conditions, where swing pricing acts as a deterrent against sudden redemptions, given the value an investor's units will need to have increased by more than the value of the swing factor for any gain to be realized. In the EU, the European Systemic Risk Board ("ESRB") has called for national securities regulators to allow for the full range of liquidity management tools, noting that swing pricing is not available in some countries – as shown in Exhibit 21. [40]

An FCA study found in 2019 that: "The same investor is significantly less likely to redeem his/her shares during a stress period at times when the fund uses an alternative pricing rule than at times when the fund uses the traditional rule. This analysis provides strong support for the hypothesis that alternative pricing structures moderate investors' behaviour and mitigate runs on funds."[41]

Where swing pricing is not available, fund boards may need recourse to other tools, such as redemption fees, redemptions in kind, suspensions, or gates, to protect remaining investors from dilution. In the most extreme cases, tools such as swing pricing may not be sufficient to mitigate material valuation uncertainty; hence most jurisdictions allow funds to suspend redemptions to address pricing uncertainty and/or impaired liquidity in the underlying markets.

Exhibit 21: ESRB assessment of certain EU liquidity management tools in the EU

EEA member state	Gates	Suspensions of redemptions	Swing pricing
Austria		☑	☑
Belgium	☑	☑	☑
Bulgaria		☑	
Croatia		☑	
Cyprus	☑	☑	☑
Czechia		☑	
Denmark		☑	
Estonia	☑	☑	☑
Spain	☑	☑	☑
Finland		☑	☑
France	☑	☑	☑
Germany	*	☑	*
Greece		☑	
Hungary		☑	
Ireland	☑	☑	☑
Iceland		☑	
Italy	☑	☑	
Latvia		☑	
Lichtenstein	☑	☑	☑
Lithuania	☑	☑	
Luxembourg	☑	☑	☑
Malta	☑	☑	
Netherlands	☑	☑	☑
Norway	☑	☑	☑
Portugal	☑	☑	☑
Romania	☑	☑	
Slovakia	☑	☑	
Slovenia		☑	
Spain	☑	☑	☑
Sweden		☑	
United Kingdom	☑	☑	☑

Source: European Systemic Risk Board "A Review of Macroprudential Policy in the EU 2019". Available at: https://www.esrb.europa.eu/pub/pdf/reports/review_macroprudential_policy/esrb.report200429_reviewofmacroprudentialpolicy~13aab65584.en.pdf?1c191dd456ce323c577cd9cbaf1fa54d..

*Germany has since modernized its liquidity risk management toolkit to permit the use of gates and swing pricing and work is currently underway at an industry level to operationalize these tools.

Use of swing pricing during the COVID-19 Crisis

As discussed in the prior section, swing pricing is used to protect investors in a fund by assigning transaction costs to transacting investors. Best in class practice is to use full or partial swings on an ongoing basis when there are significant net outflows or inflows. Given the heterogeneity of funds, the use of swing pricing, in terms of both frequency and magnitude, will differ for various funds. The frequency of the use of swing pricing increased markedly during March 2020, as did the size of swing factors to allocate the full costs of market liquidity to redeeming investors.

Data on the use of swing pricing is not readily available. Exhibits 22 and 23 show the use of swing pricing for a selected range of BlackRock-managed strategies domiciled in Europe. Exhibit 22 shows a spike in March of the number of times swing pricing was used, and Exhibit 23 shows that the size of the swing factors also increased significantly in March. These trends were particularly pronounced in certain fixed income funds as the decrease in market depth translated into larger transaction costs, especially for larger trades.

The operational, governance and regulatory processes around swing pricing were well established and tested prior to the crisis in many major European fund domiciles. In practice, fund governance committees had to frequently assess daily applicable thresholds and adjust swing factors quickly to reflect the rapid changes in underlying markets in March and April. Some jurisdictions leave maximum swing factors to the discretion of fund managers, whereas some regulators require explicit permission to increase factors beyond those stated in the prospectus. During COVID-19, some fund managers, including BlackRock, sought this permission from the Luxembourg regulator, the Commission de Surveillance du Secteur Financier ("CSSF"). The CSSF in its COVID-19 FAQ allowed swing factors to be increased on a temporary basis, subject to appropriate investor notification, and allowed managers to include swing pricing provisions where they had not previously been operationalized. Other regulators, such as France's Autorité des Marchés Financiers (AMF), provided similar guidance to managers of French funds.[42] These actions allowed the application of swing factors at a level consistent with underlying market spreads. Indeed, a number of prudential authorities, such as the Bank of England, have recognised the benefits of swing pricing and encouraged greater uptake of the mechanism.[43]

Understanding swing-pricing

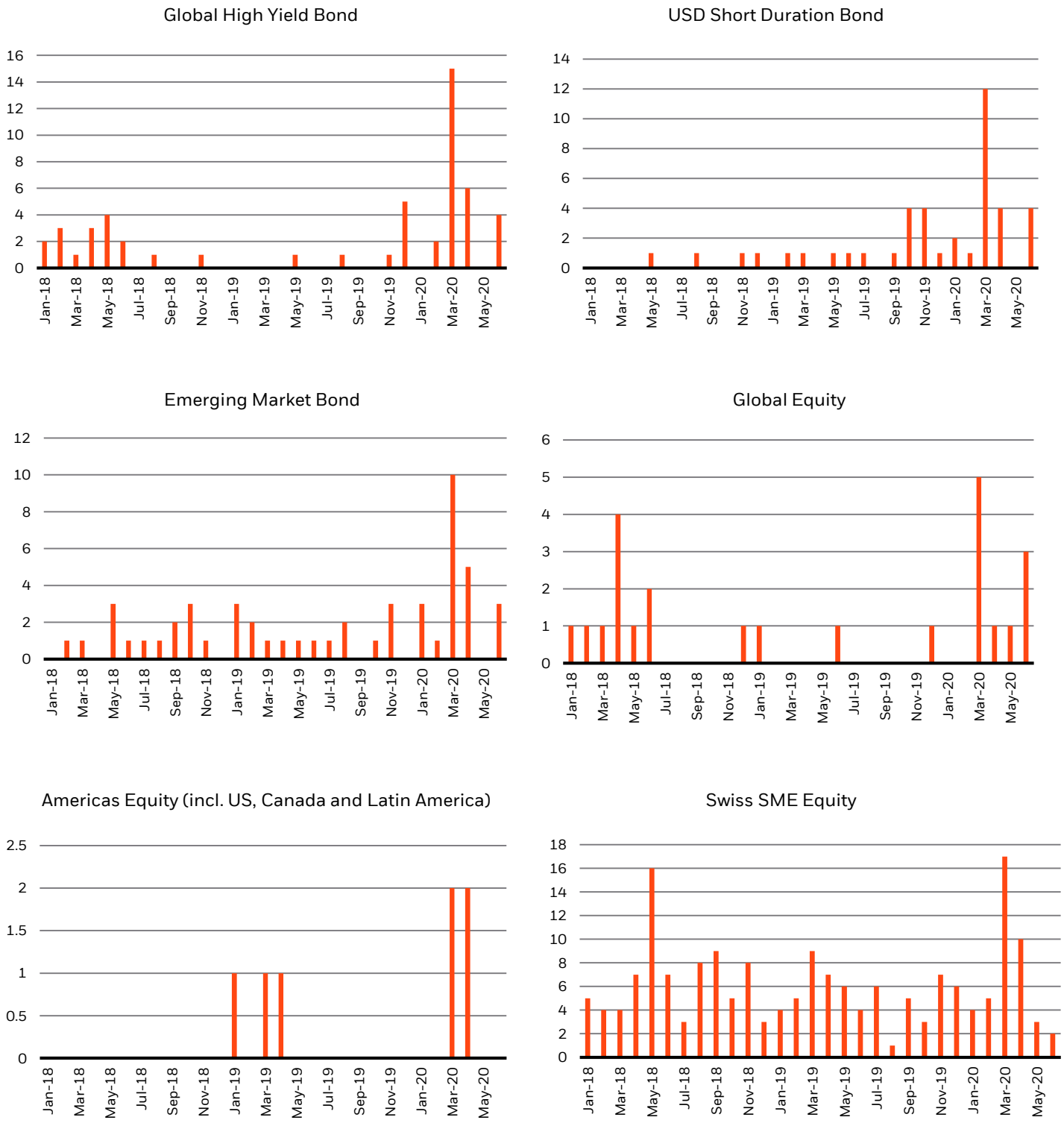
Swing pricing was introduced in the early 2000s to a number of jurisdictions – including Luxembourg, Ireland and the UK – in response to well-documented cases of "market timing."[44] Swing pricing was seen as a tool to more efficiently allocate the costs arising from trading "dilution," protecting fund performance and the interests of remaining investors. Since then, swing pricing models have evolved and are now viewed as an important liquidity management tool.

Swing pricing allows funds to adjust their share price to reduce 'dilution' occurring when the cost of transacting in the fund's underlying assets differs from the valuation reflected in fund units. These costs reflect dealing and brokerage charges, taxes and duties, market movement, and any spread between the buying and selling prices of the underlying assets. Swing factors reflect the anticipated cost of market dealing for a fund.

Swing pricing is usually automated and applies either on a "full swing" basis (where any subscription or redemption triggers a swing); or on a partial basis (where aggregate subscriptions and redemptions above a certain threshold trigger a swing). A full swing is often applied to funds marketed to institutional holders who typically place large deals; while partial swinging is more often applied to funds with a retail (or mixed retail and institutional) investor base where deals are often small. The manager will typically predetermine the threshold and the swing factor in its fund accounting system. The manager retains the flexibility to alter the threshold and swing factor in light of market events and the level of flows.

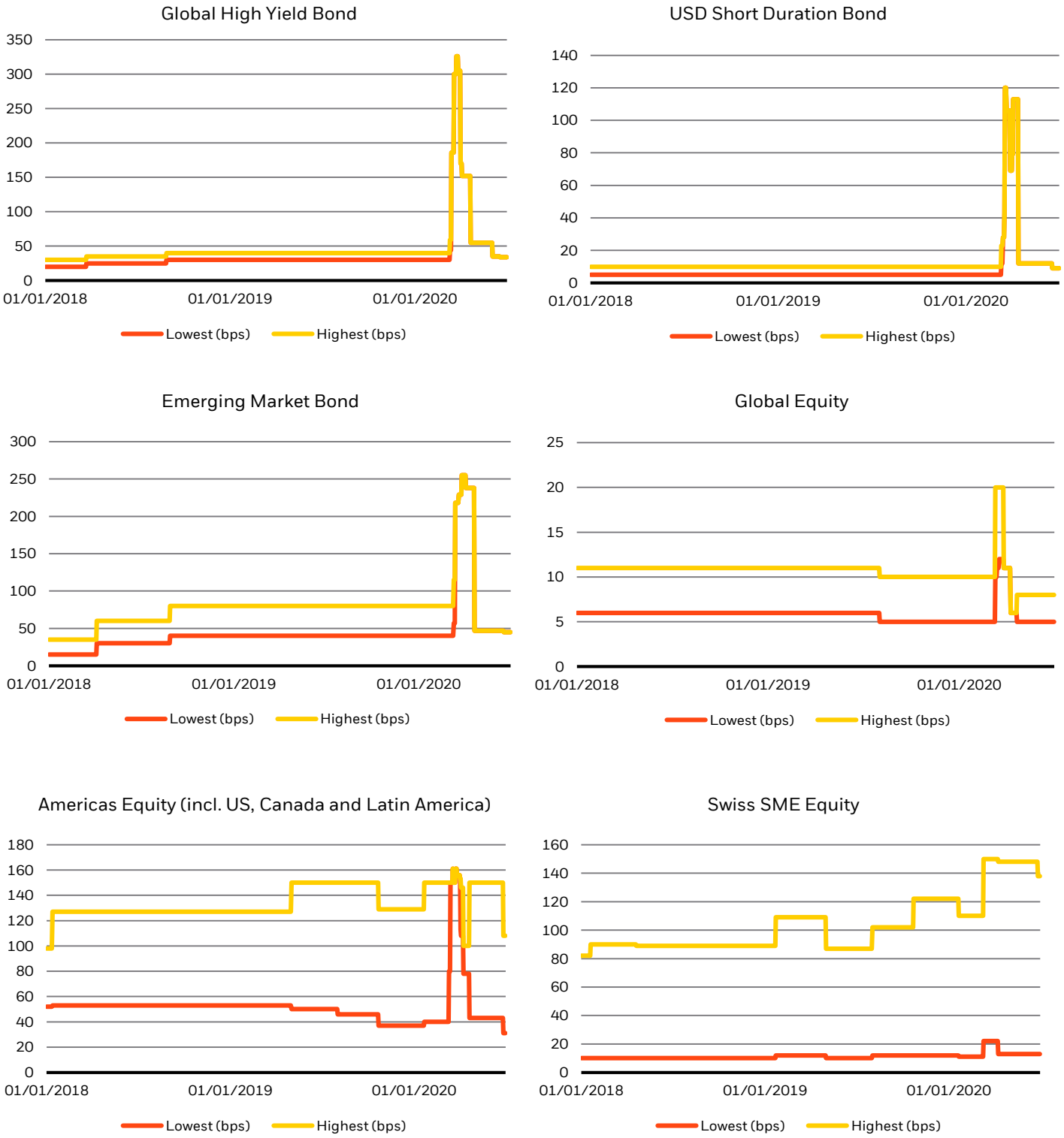
Some jurisdictions, such as Luxembourg and France, require managers to set a maximum swing factor in the fund's prospectus, while others such as Ireland leave more flexibility to managers. Where disclosed, the maximum is typically set at a level between 1% and 3%.

Exhibit 22: Frequency of swing pricing use for a selected range of BlackRock strategies domiciled in Europe (Number of times swing pricing each month)



Source: BlackRock. These charts represent fund strategies from "umbrellas funds" containing a number of sub-funds with varying investor bases.

Exhibit 23: Swing factors applied for select range of investment strategies



applied different swing factors within the range shown at any one time, hence "lowest" and "highest" swing factors for the fund range are shown in the charts. This also means that where swing factors look stable – such as the Americas Equity strategy – individual sub-fund swing factors may have been raised during market turbulence, despite the highest and lowest not changing materially.

Use of Fund Suspensions during COVID-19 Crisis

Asset managers have a range of tools available to manage their funds through periods of market disruption, or when specific events take place, to ensure the best interests of all investors are safeguarded. In exceptional circumstances, the manager may decide it is in investors' best interests to suspend dealing on a temporary basis – for example where a fund needs to meet an unusually high volume of redemption requests, or where the manager cannot value assets on a fair and accurate basis.

Fund suspensions are used rarely. High profile occurrences before the COVID-19 crisis were the result of idiosyncratic problems relating to specific asset liquidity assessment and valuation issues, and lapses in fund governance.[45] During the COVID-19 crisis, while there were market liquidity challenges, the number of suspensions was modest: a Fitch report from June 2020 notes that only 0.11% of total global mutual fund assets were suspended during the crisis.[46] This is borne out by subsequent ESMA analysis, showing that between the second half of March and May around 200 EU and UK funds (out of a universe of 60,000 European funds) had suspended dealings temporarily.[47]

> **"Overall, most of the suspensions during the reporting period were linked to valuation uncertainty in corporate bonds, OTC derivatives and real estate markets, rather than difficulties in meeting investors' outflows."**[48]
>
> European Securities And Markets Authority (ESMA)

ESMA notes that during the first half of 2020, suspensions were linked to valuation uncertainty, and as such, fund suspensions appear to have been a rational strategy to protect investors' interests. Investors recognized that these suspensions were taken to protect the fund, and these actions did not cause contagion across asset managers, asset classes or jurisdictions. Globally, fund suspensions included real estate funds in the UK, fixed income funds in Sweden; fixed income, equity, and balanced funds in Denmark; and fixed income funds in India (see case studies below).

Case Study: Danish and Swedish funds

Towards the end of March 2020, several Danish and Swedish funds (as well as Luxembourg-domiciled funds run by Nordic promoters investing in local Danish and Swedish markets) suspended dealing.[49]

An idiosyncratic feature of the Danish market is that mutual funds are listed on exchanges (although are not ETFs), and as such require multiple intra-day valuations by the fund administrator. If fund administrators are unable to obtain these valuations due to underlying market conditions, market practice and regulatory expectation is that they should suspend dealing until they can do so. In March, fund administrators determined that they could not sufficiently accurately price the assets of some funds, and so suspended redemptions for a short period, varying between two days and three weeks. Such suspensions are widely accepted as appropriate investor protection tools in Denmark: comment from the press and end investors was minimal.

> **"The exceptional market conditions seen in connection with the corona crisis can make it necessary in some cases to suspend trading in Danish investment fund units. The aim is to protect investors."**[50]
>
> Finance Denmark, 19th March 2020

In the case of Sweden, indications from the market are that during March 2020 local fund managers were unable to access accurate pricing for some fixed income securities issued in the domestic market. This was likely attributable to fragmented liquidity, the lack of single order book in the markets, and lack of willingness on the part of dealers to trade – especially in OTC instruments. Due to valuation uncertainty, some fund managers proceeded to suspend dealing in their funds until market conditions had subsided. These funds' suspensions lasted between one day and two weeks.

Case Study: UK Property Funds

Following the Brexit referendum, several property funds in the UK closed on a temporary basis reflecting issues with pricing and liquidity of the underlying assets. These actions were taken to protect investors remaining in the fund, however, they also drew attention to these funds.

In September, 2019, the UK FCA published new rules for open-ended funds investing in inherently illiquid assets such as real estate. The new rules apply to UK retail open-ended real estate funds (known as Non-UCITS Retail schemes or 'NURS') from September 2020.[51] They require managers to suspend dealing in their funds if the fund's standing independent valuer has expressed material uncertainty about the value of one or more of their assets under management and that material uncertainty applies to at least 20% of the value of the assets of the fund.[52] The UK's permission of open-ended real estate funds is unique in Europe: by comparison, retail real estate funds in Germany have a minimum holding period of two years and a redemption period of one year, and the mandatory minimum redemption period in France is one year, meaning supervisors and managers are less likely to resort to suspensions in these jurisdictions. As such, the UK approach has been under consideration for some time by the FCA, and in addition to the new rules on fund suspensions, in August 2020, the FCA launched a consultation on the dealing frequency of open-ended property funds, recommending the introduction of notice periods between 90 and 180 days to minimise the risk of repeated suspensions.[53]

In March 2020, the majority of retail and institutional real estate funds in the UK suspended redemptions. While there is no authoritative public record of fund suspensions in the UK, at least nine open-ended retail funds, managing around £11 billion, were reported to be suspended in mid-March.[54] Several real estate funds for institutional clients, even those with less frequent dealing frequencies, managing around £9 billion, followed and suspended dealing shortly after. This decision to suspend followed a warning by independent valuers that there was material valuation uncertainty in commercial real estate, and was taken in coordination with the FCA and domestic trade associations.[55] The FCA's statement at the time highlighted the valuation uncertainty in the underlying markets and concurred with the decision to suspend dealing as an investor protection measure.[56] As markets have normalized, these funds have begun to reopen.

UK Financial Conduct Authority, Statement on Property Suspensions, 18th March 2020

"The FCA understands that certain Standing Independent Valuers have determined that there is currently material uncertainty over the value of commercial real estate ("CRE"). In such situations, a fair and reasonable valuation of CRE funds cannot be established. As a result, some managers of open-ended CRE funds have temporarily suspended dealing in units of these funds and others are likely to follow for the same reason. Suspensions can be used by managers of open-ended funds, in line with their obligations under applicable regulations. In these circumstances, suspension is likely to be in the best interests of fund investors"

Case Study: Indian Bond Funds

Prior to the COVID-19 Crisis, the Securities and Exchange Board of India ("SEBI") had taken steps to tackle the risks of an increasing number of debt funds investing in illiquid lower-rated paper in search of yield. SEBI conducted a "Review of Risk Management Framework of Liquid Funds, Investment Norms and Valuation of Money Market and Debt Securities by Mutual Funds" in September 2019, and proposed to amend relevant regulations to require, among other things, in-house stress testing. SEBI ruled in October 2019 that debt funds can invest only in listed securities (such as commercial paper and non-convertible debentures). SEBI required funds to bring down their unlisted holdings to 15% by March 31st, 2020, and subsequently to 10% by June 30th, 2020. However, SEBI grandfathered the existing investments, meaning debt funds could hold on to their existing, albeit unlisted, securities until they matured.[57]

SEBI statement on in-house stress testing, September 2019

"All AMCs [Asset Management Companies] are required to conduct stress testing for all liquid funds and money market schemes at least on a monthly basis. As part of stress testing, AMC are required to test the impact of interest rate risk, credit risk and liquidity and redemption risk, among others as deemed necessary, on the NAV of the concerned schemes. Further, in the event of stress test revealing any vulnerability or early warning signal, AMCs are required to bring it to the notice of the trustees and take corrective action."[58]

On April 23rd, 2020, a fund manager announced the closure of six of its debt schemes with combined assets under management of almost Rs 26,000 crore (~USD 3.4 billion) as of April 22nd. The onset of COVID-19 triggered a sell-off in equities and debt securities, impacting markets in India as

it had elsewhere. In these conditions, unlisted securities became extremely difficult to sell. With no buyers for its securities and in the absence of market liquidity and continued redemptions, the manager chose to suspend its funds. SEBI has subsequently set up a working group to assess stress testing, minimum asset allocation in liquid assets, and the liquidity risk management tools for open-ended bond funds. [59]

Assessment of Use of Liquidity Risk Management Tools by OEFs

During the COVID-19 Crisis, transaction costs became unusually wide in fixed income markets. This reflected that dealers were unwilling to use their balance sheets for market making activities, principal trading firms were concerned about data quality and the accuracy of their models, and investors were collectively de-risking and raising cash. In this environment, some OEFs needed to meet redemptions even where underlying markets were impaired. Regulatory reforms from the GFC were helpful in that liquidity risk management programs have been elevated industrywide. This includes consideration of liquidity at the product design stage as well as portfolio construction and stress testing of portfolios for various market conditions. Importantly, this also includes governance of funds and testing of operational resilience in preparation for times of stress.

Not surprisingly, liquidity risk management is tailored for different types of funds and their investor profile. Fund managers deliberately build in layers of liquidity into the design and management of an OEF. [60] Liquid assets typically include government bonds, investment grade bonds, ETFs and derivative overlays. Multi-sector bond funds – which make up a large percentage of the fixed income bond fund universe – had ample cash to meet redemptions as they hold a significant amount of sovereigns and other liquid assets. Likewise, sector-specific funds – such as high yield and bank loan funds – held layers of liquidity which enabled them to meet redemptions. Central bank purchases and other facilities were important in calming markets and restoring investor confidence. In the US, bond funds met redemptions and did not need to use extraordinary redemption tools such as gating, suspension, redemptions-in-kind, or delayed settlement, and a small set of funds outside the US used fund suspensions primarily due to their inability to establish accurate valuations.

Some commentators have suggested that, beyond this, funds should be required to hold 'cash buffers'. Keeping in mind that investors in funds have 'redeemable equity' which is different than a bank deposit, we caution against the use of mandatory cash buffers. First, the heterogeneity of funds suggests that the appropriate amount of cash will need to differ significantly from fund to fund. Second, in the event of significant redemptions, a cash buffer would likely be inadequate to meet redemptions. A key aspect of liquidity risk management is the structure of the portfolio, looking at the liquidity risk characteristics of the entire portfolio, and anticipating the liquidity needs of investors in the fund.

Nevertheless, improvements can undoubtedly be made to elements of the LRM toolkit. One noticeable difference in Europe versus the US is the availability of 'swing pricing'. By enabling the fund to externalize transaction costs, swing pricing creates an incentive to spread out redemptions and eliminates the potential for 'first mover advantage'. We recommend that swing pricing, or comparable anti-dilution tools, be included in the toolkit for OEFs in every jurisdiction. In addition, greater transparency on client profiles would enhance redemption modeling, therefore we recommend regulators mandate disclosure of this information from distributors to fund managers.

3 **Conclusion:** Observations from the COVID-19 crisis and recommendations to reinforce OEF resilience

The impact of the COVID-19 crisis in March 2020 created challenging conditions for all market participants: the outbreak of the virus and related containment measures translated into broad risk-off sentiment and a widespread preference for cash. Combining with constraints on market intermediaries, this generated a liquidity crisis that significantly pushed up the cost of trading for many fixed income securities, including US Treasuries.

In these conditions, there was volatility across several markets and asset classes, with some commentators highlighting particular concerns about short-lived but significant dislocations in corporate bond markets, and the role played by OEFs prior to actions taken by central banks. Certainly, the events of March 2020 provided a test of OEF resilience, of post-GFC reforms to the sector, and of several concerns raised since the GFC about how OEFs would respond to a period of market stress.

As policymakers make their assessments of events in March, we stress the importance of putting into perspective the heterogeneity of OEFs, and their standing in a wider financial ecosystem of other asset owners and market participants. This is particularly important when

considering how portfolio rebalancing and de-risking impacted bond market conditions: as we have noted, bond funds represent only one type of owner of fixed income – less than 20% of any given fixed income sector in the US, for example -which is reflected in the SEC's observation that net outflows from bond mutual funds in the US are 'dwarfed' by overall trading volumes. [61]

The variation within bond fund investment styles and fixed income sub-sectors means liquidity risk management must be tailored to the type of fund: a multi-sector investment grade bond fund will be structured differently than a high yield only fund. This variation was also reflected in flows from different segments of bond funds. Importantly, though, average outflows, while heightened, were not unmanageable, and the vast majority of mutual funds met 100% of redemption requests. Importantly too, bond funds were able to use flexibility built into guidelines to manage through the credit downgrades that picked up through early 2020.

In addition to this flexibility, funds have a number of more general ex-ante liquidity risk management tools at their disposal, including portfolio construction to ensure funds have 'layers' of liquidity, modelling techniques to stress test portfolios and anticipate likely redemptions, and – importantly – structural mechanisms such as swing pricing which are used regularly and proved to be an important tool during the COVID-19 crisis. Ex-post tools, most notably suspensions of redemptions, were used by a handful of European funds, although this was in response to idiosyncratic issues and valuation uncertainty for some assets, rather than unmanageable redemptions.

In large part, the availability of these tools can be attributed to efforts following the GFC to raise liquidity risk management standards industrywide, and to ensure the widest possible toolkit was made available to fund managers, alongside enhanced reporting from funds which allowed securities regulators to monitor markets and market participants closely. That said, we believe there is more that could be done to further enhance the resilience of OEFs going forwards, and in the remainder of this section offers several recommendations.

Recommendations to reinforce OEF resilience

RECOMENDATION #1: Greater adoption of "swing pricing" or anti-dilution measures in national regulatory frameworks

There are clear benefits to funds having swing pricing or other anti-dilution mechanisms available as part of the liquidity risk management toolkit, to ensure transacting investors bear the cost of accessing liquidity. However, many jurisdictions do not permit swing pricing, while in some areas it is permitted but not operationalized. Exhibit 22 showed that swing pricing is not available in several EU jurisdictions, and Exhibit 24 below shows that it is also not available in other major jurisdictions such as Canada, China, India and Japan.

Exhibit 24: Extract from IOSCO review of liquidity management tools

EEA member state	Gates	Suspensions of redemptions	Swing pricing
Australia	☑	☑	☑
Canada		☑	
China		☑	
Hong Kong	☑	☑	☑
India	☑	☑	
Japan	☑	☑	
Singapore	☑	☑	☑
Switzerland	☑	☑	☑
United States	☑	☑	☑

Source: IOSCO Final Report on "Open-ended Fund Liquidity and Risk Management – Good Practices and Issues for Consideration," February 2018

The US is an example of a jurisdiction where swing pricing is permitted by regulation, but not operationalized in practice due to complexities in the OEF ecosystem. [62] We are aware and supportive of several initiatives aiming to rectify this. [63] We believe regulators should work with industry to facilitate the use of swing pricing or other anti-dilution tools.

While the practical changes needed to implement swing pricing may be extensive, we believe policymaker and industry effort should continue to be directed at driving these through, as well as other anti-dilution mechanisms such as redemption fees which have a similar intention. In doing this, it will be important to consider the trade-offs between different types of anti-dilution mechanisms, and to ensure investors are made aware of and educated about any newly implemented measures. In jurisdictions where maximum swing factors must be set in fund documentation, we recommend implementing a formal investor notification procedure permitting managers to temporarily increase maximum swing factors in extreme market conditions – the ad-hoc relief given by some regulators in this respect during March 2020 proved useful, and should be formalized going forwards.

RECOMENDATION #2: Facilitate access to market data and transparency on end-investor profiles

As part of their approach to liquidity risk management, asset managers already employ ex-ante measures such as stress testing the liquidity of portfolios, modelling the likely

behavior and redemption patterns of their end-investors, and calibrating swing pricing mechanisms. However, the insights that can be generated from these analytical techniques vary depending on the availability and quality of data that underpin them. While these have improved notably in recent years – thanks in part to the post-GFC drive for transparency – there is more that could be done.

In particular, the availability of timely and reliable market data is critical to properly assess market depth and transaction costs, which can in turn inform assessments of asset liquidity and calibration of swing pricing models. In Europe, this could be further improved through a real-time consolidated tape for price and volume data, and a "European Best Bid or Offer" metric, for equity and fixed income. [64]

Fully liquidity stress testing a fund requires understanding how its underlying investors might behave. For institutional investors, it is possible for asset managers to open a dialogue and anticipate their liquidity needs. For retail funds, or those that are intermediated by distribution networks, modelling investor behavior is more complicated, as the aggregation of flows limits managers' visibility of the end-investor. Policymakers should consider convening working groups of all actors involved in the fund distribution chain, with a view to improving the flow of critical information on underlying investors. Specifically, data on the types of investors transacting in omnibus accounts, the size and concentration of investor holdings, and industry-wide data on historical worst-case redemptions would all help inform better manager assessments of potential redemption patterns.

RECOMENDATION #3: Ensure fund managers are operationally prepared for stress events

The availability of robust liquidity management tools and the data to underpin them are not themselves enough to ensure managers will be in a position to make effective use of them. Tools such as swing pricing or fund suspension are employed at the discretion of asset managers and are likely to be used more intensively during a period of market stress. It is therefore crucial that managers are operationally ready to use these tools, with tested processes and governance mechanisms in place. In some jurisdictions, this preparedness is a regulatory requirement – Luxembourg's CSSF, for example, requires that "contingency plans should be implemented and periodically tested to ensure that any applicable [liquidity management tool] can be used where necessary and if being activated, can be used in a prompt and orderly manner." [65] We recommend establishing guidelines and best practices on operational preparedness across all jurisdictions.

RECOMENDATION #4: Mandate shorter bank loan settlement periods

Bank loan funds, a notable feature of the US market, could have been cause for concern given their extended settlement window. However, in recent stress scenarios – December 2018 and March 2020 – they have met 100% of redemption requests. This is partly due to banks notably shortening settlement periods during each stress event. We therefore recommend a reduction in the settlement window. Ideally, we recommend 3 days for settlement, which would make bank loan settlements consistent with bonds and other securities, and significantly improve their structural liquidity characteristics of bank loans. For several years, investors have proposed changes to the structure of bank loans, including standardization of deal structures and the elimination of manual elements of the operational environment. We encourage bank regulators to consider codifying these changes, as well as measures to improve data availability and transparency around bank loans.

RECOMENDATION #5: Exercise caution when considering macroprudential regulation for OEFs

Some commentators have suggested that macroprudential policy measures should be applied to OEFs, in response to concerns around liquidity mismatches between fund redemption terms and underlying assets.

We believe macroprudential policy measures would be at best ineffective, and at worst procyclical, while also curtailing investors desire to deploy capital via funds. [66] One notable suggestion is for a cash or liquidity buffer for funds, whereby a pre-specified portion of fund assets would be held in cash or highly liquid assets in normal market conditions, to be drawn down during stressed periods. Notwithstanding the cash drag this would impose on fund investors, such a measure would likely be ineffective – as buffers may not be sufficient to meet redemptions, and would leave a less liquid portfolio to meet any subsequent outflows; and procyclical – as once diminished, buffers would need to be built up by selling down other fund assets. We are similarly concerned with other macroprudential measures that have been suggested, such as mandatory leverage limits, centralized redemption gates and suspension, or centralized counter-cyclical margining and haircutting practices, as discussed in our *ViewPoint:* Macroprudential policies and Asset Management.

By contrast, a continued focus on products and activities regulation – including the enhancements to LRM outlined above, improving market structure, and reviewing the role of key intermediaries is the most effective way to address these concerns. [67]

Endnotes

1. Separate *ViewPoints* describe the experience of specific open-ended fund types. We discuss the issues in short-term markets and money market funds in two related *ViewPoints*, "Lessons from COVID-19: The Experience of European MMFs in Short-Term Markets" and "Lessons from COVID-19: US Short-Term Money Markets." Our *ViewPoint* Lessons From COVID-19: U.S. Municipal Bond Market describes the municipal bond ecosystem and makes recommendations to improve price discovery for investors and to further enhance the liquidity risk management toolkit for fund managers. Likewise, our *ViewPoint* "Lessons from COVID-19: ETFs as a Source of Stability" sets out the positive role played by ETFs during March 2020.
2. "Open-end funds" includes UCITS funds, funds registered under the US Investment Company Act of 1940, and other alternative funds which offer regular dealing and which are broadly distributed.
3. We discuss the portfolio rebalancing activities of different types of end-investors in two *ViewPoints:* "Who owns the assets? Developing a better understanding of the flow of assets and the implications for financial regulation"; and "Who owns the assets? A closer look at Bank Loans, High Yield Bonds, and Emerging Market Debt".
4. For example, the ECB's press release accompanying the announcement of the Pandemic Emergency Purchase Programme (PEPP) noted its aim of "counter[ing] he serious risks to the monetary policy transmission mechanism and the outlook for the euro area posed by the outbreak and escalating diffusion of the coronavirus, COVID-19". See ECB (March 2020) Press Release: "ECB announces €750 billion Pandemic Emergency Purchase Programme (PEPP)".
5. Federal Reserve Z.1 data as of June 2020. Available at: https://www.federalreserve.gov/releases/z1/20200611/z1.pdf. See also our ViewPoint – Lessons from COVID-19: Overview of Financial Stability and Non-Bank Financial Institutions.
6. US Securities and Exchange Commission, Division of Economic and Risk Analysis, "US Credit Markets: Interconnectedness and the Effects of the COVID-19 Economic Shock," October 2020
7. Speech by Robert Ophèle, AMF Chairman at the 2020 CMVM Annual Conference: "Financial Stability – the perspective of the non-banking financial sector", 8 October 2020
8. In the EU, ESMA has mandated surveys for UCITS, in addition to AIFMD Annex IV reporting. In the US, there are sections of Form N-PORT that pertain to liquidity also.
9. Luxembourg's Commission de Surveillance du Secteur Financier in its COVID-19 FAQ allowed swing factors to be increased on a temporary basis, subject to appropriate investor notification, and allowed managers to include swing pricing provisions where they had not previously been operationalized.
10. Depending on the relevant rule making powers in relevant jurisdictions, these changes can be driven directly by national securities regulators, but in other jurisdictions changes to primary legislation may be needed.
11. For further discussion, see our ViewPoint – Macroprudential Policies and Asset Management.
12. We discuss this downgrade cycle and its implications in two *ViewPoints*: Lessons from COVID-19: U.S. BBB Bonds and Fallen Angels and European BBB Bonds and Fallen Angels.
13. S&P, as of July 31, 2020.
14. LSTA Secondary Trading & Settlement Study: Second Quarter 2020, July 2020
15. LSTA Secondary Trading & Settlement Study: Second Quarter 2020, July 2020
16. Daleep Singh, Executive Vice President, Federal Reserve (October 2020) "The Federal Reserve's Corporate Credit Facilities: Why, How, and For Whom" – Remarks at The U.S. Chamber of Commerce's Center for Capital Markets Competitiveness (delivered via videoconference).
17. Federal Reserve, "Periodic Report: Update on Outstanding Lending Facilities Authorized by the Board under Section 13(3) of the Federal Reserve Act", as of August 8, 2020.
18. On June 15, the Fed announced that it would purchase corporate bonds to create a portfolio "based on a broad diversified market index of U.S. corporate bonds" subject to these criteria. See: Federal Reserve, "Federal Reserve Board announces updates to Secondary Market Corporate Credit Facility (SMCCF), which will begin buying a broad and diversified portfolio of corporate bonds to support market liquidity and the availability of credit for large employers"
19. See Federal Reserve, "SMCCF Term Sheet," Updated July 28, 2020; and Federal Reserve, "Periodic Report: Update on Outstanding Lending Facilities Authorized by the Board under Section 13(3) of the Federal Reserve Act," August 8, 2020
20. Daleep Singh, Executive Vice President, Federal Reserve (October 2020) "The Federal Reserve's Corporate Credit Facilities: Why, How, and For Whom" – Remarks at The U.S. Chamber of Commerce's Center for Capital Markets Competitiveness (delivered via videoconference).
21. Informa Financial Intelligence, available at: https://financialintelligence.informa.com/epfr/epfr-product-overview. $34 trillion includes assets of ETFs.
22. US Securities and Exchange Commission, Division of Economic and Risk Analysis, "US Credit Markets: Interconnectedness and the Effects of the COVID-19 Economic Shock," October 2020
23. EPFR. As of 26 February 2020.
24. S&P Global Market Intelligence, "Leveraged Loan Primer".
25. Bank loans are not considered eligible assets for UCITS, so bank loan funds are not typically offered in an OEF format in Europe.
26. Morningstar, as of August 31, 2020
27. LSTA Secondary Trading & Settlement Study: Second Quarter 2020, July 2020
28. European Central Bank, "Pandemic Emergency Purchase Programme (PEPP)".
29. On Gilt and Corporate Bond purchases, see Bank of England "Asset Purchase Facility (APF): Additional Corporate Bond Purchases – Market Notice 2 April 2020", available at:. On the repo facility, see Bank of England "Bank of England launches Contingent Term Repo Facility".
30. Association of the Luxembourg Fund Industry, "Global Fund Distribution 2019".
31. For example, using EPFR data to look at all Europe-domiciled corporate bond funds (excluding ETFs) in the week to 18 March, the weighted average outflow was -2.98%. However, while the majority of funds were experiencing outflows, a non-trivial portion were not: 16% of funds saw inflows during this week.
32. IOSCO Recommendations for Liquidity Risk Management for Collective Investment Schemes Final Report and Open-ended Fund Liquidity and Risk Management – Good Practices and Issues for Consideration, 2018.
33. BlackRock ViewPoint, "The Decade of Financial Regulatory Reform: 2009 to 2019"

Endnotes

34. SEC final rule, Investment Company Liquidity Risk Management Programs (17 CFR Parts 210, 270, 274), October 2016. The SEC subsequently amended Rule 22e-4 in 2018, aiming to improve the reporting and disclosure of liquidity information: "Investment Company Liquidity Disclosure." Additional information on the SEC's Investment Company Liquidity Risk Management Program Rules is available at: https://www.sec.gov/divisions/investment/guidance/secg-liquidity.htm.
35. See in particular the Eligible Asset Directive 2007/16/EC of 19 March 2007 regarding illiquid asset limits; and Directive 2009/65/EC of the European Parliament and of the Council of 13 July 2009 regarding the role of depositaries.
36. European Securities and Markets Authority "Final Report: Guidelines on liquidity stress testing in UCITS and AIFs".
37. IOSCO "Statement on IOSCO Liquidity Risk Management Recommendations for Investment Funds", 18 July 2019
38. European Securities and Markets Authority Letter to the European Commission "Review of the Alternative Investment Fund Managers Directive".
39. For example, see our informational document "Swing Pricing: The dilution effects of investor trading activity on mutual funds".
40. ESRB Review of Macroprudential Policy in the EU 2019 notes that "The use of liquidity management tools can allow fund managers to avoid fire sales and effectively manage unexpectedly high fund redemptions. Liquidity management tools are an important part of the risk management toolkit and can help to prevent problems in specific funds from amplifying or causing wider market disruption." See European Systemic Risk Board "A Review of Macroprudential Policy in the EU 2019". An earlier ESRB Recommendation on liquidity and leverage risks in investment funds proposed the inclusion of additional liquidity management tools for investment fund managers across EU jurisdictions. A wider range of liquidity management tools improves funds' resilience to redemptions and asset managers' ability to respond to exceptionally high levels of redemption requests. The 2019 review notes that "Since the issuance of the recommendation in 2017, some Member States (e.g. BE, DE, ES, LT, PT) have already expanded the range of liquidity management tools that can be used by asset managers located in their jurisdiction. Other jurisdictions (DK, HU, LV, SE) continue to only have the suspension of redemptions available to asset managers."
41. FCA "Occasional Paper on Swing Pricing", May 2019.
42. AMF "Continuity of Management Activities During the Coronavirus Crisis". The AMF "favours the use of 'swing pricing' and 'anti-dilution levies' mechanisms during the current crisis, given the low liquidity of certain underlying assets and the sometimes high costs involved in restructuring portfolios." By contrast, Irish rules do not require the disclosure of a maximum swing factor and therefore additional regulatory relief was not required.
43. Bank of England "Financial Stability Report May 2020".
44. The market timing scandal in 2003 resulted from the discovery of illegal late trading and market timing practices on the part of certain hedge fund and mutual fund companies.
45. Outside of the COVID stress event, there have been a small number of high-profile fund suspensions. In December 2015, the Third Avenue Focused Credit Fund suspended redemptions and subsequently wound down. In June 2019, the Woodford Equity Income Fund suspended redemptions after a protracted period of underperformance and outflows, and was also subsequently closed and wound down. Finally, in August 2020, a series of funds run by H2O asset management were suspended in response to ongoing valuation issues which had been widely reported on since 2019. In this case, the fund's manager worked with the Autorité des Marches financiers to set up a 'side pocket' structure to deal with exposures to private fixed income securities subject to valuation uncertainty. Importantly, the suspension of these funds did not cause any wider 'spillover' effects.
46. See Fitch, "More Mutual Funds Suspend Redemptions Due to Liquidity Mismatch", June 2020.
47. European Securities and Markets Authority "Report on Trends, Risks and Vulnerabilities", September 2020.
48. European Securities and Markets Authority "Report on Trends, Risks and Vulnerabilities", September 2020.
49. FCA "Illiquid assets and open-ended funds and feedback to Consultation Paper CP18/27", September 2019. UCITS, which are already subject to restrictions preventing them from investing in assets such as real estate, are not affected.
50. Finance Denmark "The implications of suspending trading in Danish investment fund units", March 2020.
51. FCA "Illiquid assets and open-ended funds and feedback to Consultation Paper CP18/27", September 2019. UCITS, which are already subject to restrictions preventing them from investing in assets such as real estate, are not affected.
52. FCA Rulebook COLL 7.2.-3 R
53. FCA "CP20/15: Liquidity mismatch in authorised open-ended property funds", August 2020.
54. Bloomberg News "At Least $13 Billion of Investor Cash Is Frozen in U.K. Property Funds", March 2020.
55. Royal Institute of Chartered Surveyors, "Impact of COVID-19 on valuation", July 2020.
56. FCA "Statement on property fund suspensions", March 2020.
57. SEBI "Review of investment norms for mutual funds for investment in Debt and Money Market Instruments", October 2019.
58. SEBI "Review of investment norms for mutual funds for investment in Debt and Money Market Instruments", October 2019.
59. Asia Asset Management "India regulator may require bond funds to hold more liquid assets, report says", July 2020.
60. An exception to this is in funds replicating an index such as an ETF. See our ViewPoint: "Lessons from COVID-19: ETFs as a Source of Stability" where we explain the role of secondary market trading in providing liquidity to investors.
61. US Securities and Exchange Commission, Division of Economic and Risk Analysis, "US Credit Markets: Interconnectedness and the Effects of the COVID-19 Economic Shock," October 2020
62. See Investment Company Liquidity Disclosure, Investment Company Act Release No. 33142, 81 Fed. Reg. 82142 (Nov. 18, 2016), available at https://www.sec.gov/rules/final/2018/ic-33142.pdf.
63. *See* Global Association of Risk Professionals Comment Letter, "Open-End Fund Liquidity Risk Management Programs; Swing Pricing; Re-Opening of Comment Period for Investment Company Reporting Modernization Release", January 2016. *"GARP, and the Swing Pricing Committee, evaluated in detail the SEC's proposal on swing pricing and strongly agrees with the proposal to allow U.S. open-end mutual funds to employ swing pricing on a voluntary basis. However, significant operational challenges exist today which will likely impede the broad adoption of swing pricing by U.S. open-end mutual funds without material changes to the existing mutual fund-related infrastructure… As a result of these discussions, we are describing herein a "roadmap" for evolving the US infrastructure to enable swing pricing."* See also ICI, "Evaluating Swing Pricing: Operational Considerations", November 2016; and ICI, "Evaluating Swing Pricing: Operational Considerations (Addendum)", June 2017.
64. We have discussed the current limitations of EU market data in our 2019 *ViewPoint:* Mark-to-market structure: An end-investor perspective on the evolution of developed equity markets.
65. CSSF "Circular 19/733 on contingency planning in the use of liquidity management tools", December 2019.
66. See our ViewPoint – Macroprudential Policies and Asset Management.
67. See our ViewPoint – Lessons from COVID-19: Overview of Financial Stability and Non-Bank Financial Institutions.

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